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Need for Improving Management of U.S. Oceanographic Assets. CED-78-125; B-145099. June 16, 1978. 22 pp. + 2 appendices (3 pp.).

Report to Rep. John Breaux, Chairman, House Committee on Merchant Marine and Fisheries: Oceanography Subcommittee; by Robert F. Keller, Acting Comptroller General.

Contact: Community and Economic Development Div.
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Congressional Relevance: House Committee on Merchant Marine and Fisheries: Oceanography Subcommittee. Rep. John Breaux.
Authority: S. Res. 222 (93rd Cong.).

In response to congressional concerns, the Nation's ocean research/survey fleet was reviewed, and information was compiled on the fleet's costs and operations.
Findings/Conclusions: Managing and operating ocean research/survey vessels is still highly decentralized throughout the Federal Government. Federal oceanic activities are conducted by 21 organizations in 6 departments and 5 agencies. There is no overall Government-wide guidance, limited review of operations, and no formal system to assess the necessary levels of operations or to plan needed assets for a national program. This fragmentation has contributed to inefficient use of the Nation's ocean research/survey fleet. Also, inadequate vessel accounting standards make it difficult to compare costs for similar services from other sources. A comparative analysis with foreign oceanographic capabilities showed that the Soviet Union, France, and the United Kingdom have centralized management and comprehensive ocean policies. Although the Soviet Union has achieved a great deal in oceanographic research, the quality of the U.S. effort is still superior. Recommendations: Until a comprehensive national ocean policy is established, the Congress should designate a single manager for Government-wide civilian agency oceanographic vessel operations who will insure that: uniform operations policies and procedures are established for monitoring vessel activities, effective management of existing vessels is accomplished, viable alternatives are considered before authorizing new vessel construction, and standardized vessel accounting procedures are established and maintained. An alternative to a single manager would be a Government-wide Fleet Allocation Council. The Secretary of Defense should direct the Secretary of the Navy to reorganize and consolidate management

of all Navy oceanographic activities under a single manager, and to assist coordination with the designated civilian manager. The Secretary of Commerce should direct the Administrator of the National Oceanic and Atmospheric Administration to review its vessel operations policies to ensure that vessels are used as efficiently as possible. (HTW)

6757

REPORT BY THE

Comptroller General

OF THE UNITED STATES

Need For Improving Management Of U.S. Oceanographic Assets

The Chairman, Subcommittee on Oceanography, House Committee on Merchant Marine and Fisheries, because of congressional concern over use of the ocean and its possible contribution to improving world peace and the quality of life, requested that GAO review the Nation's ocean research/survey fleet and compile information on its cost and operations.

The United States has no comprehensive national ocean program or plan. Federal oceanic activities are conducted by 21 organizations in 6 departments and 5 agencies. As a result, oceanographic vessels operated to support these activities are funded, operated, and managed independently of one another. No single agency is responsible for the overall coordination or management of the fleet or its operations.

CED-78-125
JUNE 16, 1978

COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-145099

The Honorable John Breaux
Chairman, Subcommittee on Oceanography
House Committee on Merchant Marine
and Fisheries
House of Representatives

Dear Mr. Chairman:

In response to your January 9, 1978, request and subsequent discussions with your office, we reviewed the operations of the Nation's oceanographic research/survey fleet. This report identifies some of the problems noted and addresses the need for improving management of U.S. oceanographic assets.

At your request, we did not take additional time to obtain formal agency comments on the matters discussed in the report. The matters covered in the report, however, were discussed with agency officials and their comments are incorporated where appropriate.

We are sending copies of this report to the Director, Office of Management and Budget, the heads of departments and agencies whose programs we discuss, Members of Congress, and other interested parties.

Sincerely yours,

ACTING Comptroller General
of the United States

COMPTROLLER GENERAL'S REPORT TO THE SUBCOMMITTEE ON OCEANOGRAPHY HOUSE COMMITTEE ON MERCHANT MARINES AND FISHERIES

NEED FOR IMPROVING MANAGEMENT OF U.S. OCEANOGRAPHIC ASSETS

D I G E S T

A lack of a coordinated and definitive U.S. Government ocean policy, proliferation of ocean related programs and vessels, and an increasing number of nations using the oceans has led to fragmentation of important ocean affairs and marine science activities. The United States finds itself in a position of relative decline in ocean research/survey vessels.

There has been little incentive for Federal agencies to communicate and coordinate with each other on their oceanographic operations, and there has been little change in the mission oriented attitudes of agencies.

Managing and operating ocean research/survey vessels is still highly decentralized throughout the Federal Government. There is no overall Government-wide guidance and each agency continues to operate independently. There is also only limited review of oceanographic vessel operations outside the individual agencies. There is no formal system to assess and determine the necessary levels of vessel operations or to plan needed oceanographic vessel assets for an overall U.S. national program.

Further, incomplete and inadequate vessel accounting standards make it difficult to determine and compare vessel costs for similar services from agencies and commercial sources. Hence, it is difficult to determine how and by whom oceanographic vessels should be operated to ensure efficiency and economy to the Government.

This fragmented and decentralized use of oceanographic vessels has created a lack of overall management control and contributed to inefficient and uneconomical use of the Nation's ocean research/survey fleet. A comparative analysis of U.S. and foreign oceanographic capabilities showed that the Soviet

Union, France, and the United Kingdom have centralized management of their oceanic activities and vessel operations and have designed comprehensive ocean policies. GAO also noted that the Soviet Union has achieved remarkable accomplishments in developing its ocean science activities and currently operates a fleet of over 200 oceanographic vessels. In spite of the massive Soviet effort, most experts agree that the quality of U.S. oceanographic research is superior.

Agencies operating oceanographic research vessels agree that more effective use of oceanographic resources should be accomplished. They disagree, however, with the concept of centralized management because of differing agency missions and oceanographic programs.

By addressing these problems from a Government-wide rather than independent viewpoint, the Congress would be able to better determine what the Nation's vessel requirements are and how to satisfy such requirements economically and efficiently.

RECOMMENDATIONS

Until a comprehensive national ocean policy is established, the Congress should designate a single manager for coordinated and efficient Government-wide civilian agency oceanographic vessel operations This single manager should have the responsibility and authority to insure that:

--Uniform operations policies and procedures are established for monitoring all oceanographic vessel activities so that priority needs are met and duplication of efforts is avoided.

--Effective management and use of existing vessels is accomplished to avoid unnecessary construction of new vessels.

--All viable alternatives, such as leasing or conversion of old hulls are considered before authorizing new vessel construction.

--Standardized and uniform vessel accounting procedures are established and maintained.

An alternative choice to a single manager would be a Government-wide Fleet Allocation Council which could be composed of oceanographic vessel managers from the agencies that operate oceanographic ships, and which would have the same authority as a single manager.

The Secretary of Defense should direct the Secretary of the Navy to reorganize and consolidate management of all Navy oceanographic activities under the Oceanographer of the Navy or another designated single manager, and to assist and improve coordination with the designated civilian manager to maximize the utilization of all U.S. oceanographic vessels.

The Secretary of Commerce should direct the Administrator of the National Oceanic and Atmospheric Administration to review its vessel operations policies to ensure that vessels are used as economically and efficiently as possible.

Contents

ABBREVIATIONS

CNA	Center for Naval Analysis
CNEXO	National Center for the Exploitation of the Oceans
GAO	General Accounting Office
NOAA	National Oceanic and Atmospheric Administration
NSF	National Science Foundation
UNOLS	University National Oceanographic Laboratory System
USCG	United States Coast Guard
USGS	United States Geological Survey

CHAPTER 1

INTRODUCTION

The Chairman, Subcommittee on Oceanography, House Merchant Marine and Fisheries Committee, requested that we expand an ongoing review of the Nation's ocean research/survey fleet and compile information on the fleet's cost and operations.

Because of concern over the use of the ocean and its possible contribution to improving world peace and the quality of life, the Senate on February 19, 1974, unanimously passed Senate Resolution 222 authorizing the Senate Committee on Commerce to undertake a National Ocean Policy Study. On February 28, 1974, the Chairman of the Senate Committee on Commerce requested that we obtain information on Federal agencies administering programs related to marine science activities and oceanic affairs.

On February 25, 1975, we issued to the Congress our first report entitled "Federal Agencies Administering Programs Related to Marine Science Activities and Oceanic Affairs" (GGD-75-61). This report discussed and described Federal ocean programs and concluded that 22 activities in 6 departments and 5 agencies were conducting marine science activities at a cost of over $1.6 billion in 1975. The expenditures for Federal oceanic programs were projected to be nearly $2 billion in 1977.

On October 10, 1975, we issued a second report to the Congress entitled "Need for a National Ocean Program and Plan" (GGD-75-97). This report discussed problems that hindered effective Federal management of marine science activities and oceanic affairs and described attempts to achieve coordination in Federal oceanic programs. We pointed out that experts disagreed on the effectiveness of the Federal ocean programs and that it was doubtful that the resources of the departments and agencies were being applied in a manner to best serve national purposes.

In this third report on Federal oceanic affairs, we address the problems associated with operating federally owned and/or funded ocean research and survey vessels and provide a comparative analysis of U.S. and foreign oceanographic fleets.

DESCRIPTION OF THE NATION'S OCEANOGRAPHIC FLEET

Research and mapping at sea requires ships equipped with laboratories, winches, special navigation equipment,

computers, and other equipment which make them suitable for oceanographic work. Once in operation, these vessels must be maintained, and when their useful life is ended, if necessary, they must be replaced.

Oceanographic vessel uses and related agency missions can be collectively described under three broad categories--ocean science, oceanographic and hydrographic surveys, and ocean engineering and development.

"Oceanography," the term generally used for ocean science, consists of many disciplines, such as physics, chemistry, geology and geophysics, biology, and mathematics, that are used to obtain knowledge about a broad variety of environmental parameters. Such parameters include understanding the relation between ocean circulation patterns and living resources and the relation between underwater acoustics and national security issues involving submarine warfare.

Mapping and charting programs consist primarily of oceanographic and hydrographic vessel surveys and the production of charts for all ocean areas. These charts are used by the mariner and the merchant marine to provide for safe navigation, and by the Department of Defense for national security purposes. Data is collected in U.S. and foreign coastal areas to satisfy hydrographic chart requirements, while the Department of the Navy collects deep ocean mapping and charting data to satisfy both the merchant marine and national security requirements.

Ocean engineering programs in both the civilian and military oceanographic communities consist of such things as research and development programs in underseas search, salvage, diving, construction, medicine, and oceanographic instrumentation. These programs also include capabilities related to the analysis of offshore oil drilling and the potential for tapping the ocean's thermal energy.

In 1977, over $126 million was spent to operate and maintain the Nation's oceanographic fleet. The fleet is composed of 60 oceanographic research vessels and 21 survey vessels, which are operated and/or funded within Federal departments primarily by the

--Oceanographer of the Navy,

--National Oceanic and Atmospheric Administration (NOAA)

--United States Coast Guard (USCG), and

--National Science Foundation (NSF).

The Oceanographer of the Navy operates a fleet of 12 vessels, which consist of 9 coastal hydrographic and deep ocean survey vessels and 3 oceanographic research vessels. The Navy uses oceanographic vessels primarily for national security purposes, but it also shares technological data with other agencies and supports basic ocean research in some academic institutions.

The NOAA research/survey fleet currently consists of 24 vessels, making it the Nation's largest nonmilitary fleet under one manager. These vessels are designed and equipped to conduct hydrographic and marine geophysical surveys, oceanographic investigations, coastal circulatory and ecological studies, and scientific and fishing research.

USCG currently operates a fleet of six icebreakers. As noted in table 1, on pages 13 and 14, one of these icebreakers is planned for retirement in 1978. These vessels represent the sole U.S. capability for transit of ice covered surface waters in the polar regions. They are used to facilitate transportation, provide a national defense capability, and support other agencies' activities in the Arctic and Antarctic. These icebreakers are also used by organizations which wish to conduct oceanographic research or data gathering. Primary users are the Navy and NSF. USCG also operates one ice reinforced vessel, the USCG Evergreen which is primarily dedicated to support of the International Ice Patrol and other USCG missions.

NSF provides the primary support for the federally funded academic operated research fleet. Currently, this fleet consists of 28 ships that are operated by 15 different institutions. Twenty of the ships were constructed with Federal funds and 14 are still owned by the Federal Government (10 by the Navy and 4 by NSF). Use of these ships is coordinated through the University National Oceanographic Laboratory System (UNOLS), which was set up by the academic community.

Other agencies and activities, such as U.S. Geological Survey (USGS) and the Navy's undersea surveillance office, operate 10 of the ocean research and survey vessels to conduct research and charting related to their missions.

SCOPE OF REVIEW

We reviewed the management of oceanographic vessel operations and programs at the following departments and agencies:

--Department of Commerce.

--Department of the Interior.

--Department of the Navy.

--Department of Transportation.

--NSF.

We also visited Government laboratories and academic institutions that operate and/or receive Federal support for oceanographic vessels and programs. In addition, we visited several international organizations and hydrographic and oceanographic activities in France and the United Kingdom. We also made a comparative analysis of U.S. and foreign oceanographic fleets.

CHAPTER 2

ISSUES AND PROBLEMS IN MANAGING THE NATION'S OCEANOGRAPHIC FLEET

The United States has no comprehensive national ocean program or plan. Federal oceanic activities are conducted by 21 organizations in 6 departments and 5 agencies. (See app. II.) As a result, vessels operated to support these activities are independently funded, operated, and managed. No single agency is responsible for the overall coordination or management of the fleet or its operations; there are no Government-wide policies or procedures for agencies to follow.

INTERAGENCY COORDINATION HAS NOT BEEN EFFECTIVE

Two methods have been tried to achieve interagency coordination. The first was the Interagency Committee on Marine Science and Engineering created in April 1971, which provided a forum for information exchange. This committee, however, did not have authority to (1) determine what programs should be undertaken, (2) establish priorities, or (3) decide the amount of resources. The second attempt provided for bilateral and multilateral agreements among agencies on specific areas of mutual interest.

We found that these methods were not successful and there has been a fragmented and often uncoordinated effort in managing Federal oceanographic vessels. The following statement best describes the situation.

> "* * * The existing Federal oceans program lacks both clearly defined objectives and top-level support. As a result, individual ocean policy decisions made within the existing fragmented Federal structure are uncoordinated, often have directly competing objectives, and clearly fail to maximize the potential of our ocean activities. Lack of strong high-level support for ocean activities within the executive branch virtually guarantees low visibility, low budgets, and less than optimal results. * * *" 1/

1/From the national ocean policy study, inserted in the Congressional Record on April 13, 1976.

In examining the records of the various agencies and departments managing and operating oceanographic vessels we found numerous examples of uncoordination, as well as a decline in the U.S. capability to conduct ocean research aboard federally owned and supported vessels.

For instance, because of budgetary constraints, from 1970-76 Navy officials decided to lease eight of their ocean research vessels to six foreign countries, one Federal agency and one U.S. university, rather than place capable vessels in mothballs. These ships and their recipients are shown below.

Ship	Recipient
Gillis (T-AGOR-4)	University of Miami
Davis (T-AGOR-5)	New Zealand
Eltanin (T-AGOR-8)	Argentina
Keathley (T-AGS-35)	Taiwan
Kellar (T-AGS-25)	Portugal
Sands (T-AGOR-6)	Brazil
Lee (T-AGS-31)	USGS
Gibbs (T-AGOR-1)	Greece

While the Navy was leasing these ships at no cost to foreign countries, NSF was constructing several new ocean research vessels. Further, in 1974 NSF entered into a 5-year agreement with the Argentine Navy to conduct research on the Eltanin (T-AGOR-8) which the Navy leased to Argentina in 1973. Before fiscal year 1974, this ship had been operated by the Navy and NSF under an interagency agreement. NSF officials stated that other ice strengthened vessels were not available for charting the Antartic coast oceans and it was more economical to enter into a 5-year agreement with the Argentine Navy.

When we reviewed the NSF/Argentine Navy agreement, we found that the cost to use the Eltanin was $1 million in 1976--equal to the same daily cost incurred by the U.S. Navy when they operated the vessel in 1974.

USGS officials stated that they had attempted to obtain the Navy owned vessel, Sands (T-AGOR-6), but when they learned that the Navy would declare it surplus, it had already been given to Brazil.

USGS officials also stated that they were also having difficulty in obtaining time on federally funded and/or owned university operated research vessels. Officials of UNOLS, which coordinates the activities of university operated vessels, told us that academic institutions were concerned about denying their own staff time at sea by giving up a ship to

USGS. Although UNOLS officials said that they were not in the business of providing ships for lease, we found that academic institutions had leased ships to the U.S. Navy, American Telephone and Telegraph, and, with Navy concurrence, a large Navy owned ocean research vessel was used for the production of a commercial motion picture.

A U.S. Navy vessel utilization study pointed out that in 1975 there were about 1,500 unscheduled ship days available for 19 academic ships they analyzed. Yet, during this same period, NOAA spent over $4.3 million to reactivate three ships they had mothballed in '73. These three ships were reactivated in response to a special energy appropriation to conduct research on the Alaskan outer continental shelf. It appears that federally owned and/or funded ships with similar capabilities as those required by NOAA were available and could have been used.

Because of the lack of coordination, it appears that some agencies are mothballing and giving ships up at the same time that other agencies are building or leasing ships to meet priority oceanographic research needs. When we questioned various agency officials about why individual agencies do not coordinate their research and survey programs, one official stated:

> "Until such time as there is an overall coordinated national oceanographic program directed toward meeting national needs, I can see little sense in trying to coordinate the operation of research ships that are dedicated to carrying out the work at sea for separate, specific, and almost totally uncoordinated projects."

ACTION NEEDED TO ENSURE MORE EFFECTIVE MANAGEMENT AND USE OF U.S. OCEANOGRAPHIC FLEET

We analyzed the capability, cost, condition, and use of the Federal oceanographic fleet. Table 1 on pages 13 and 14 provides statistical data on the length, age, condition, desired retirement date, and special capabilities of each vessel. Table 2 on pages 15 and 16 provides a summary of data as furnished by the various agencies on the daily operation cost and use of each vessel for fiscal years 1976, 1977, and 1978.

In collecting and analyzing this data we identified a number of problems which need to be addressed to achieve effective management and use of the U.S. fleet. We believe that for the most part these problems result from the lack

of coordination between responsible Federal agencies and the lack of a unified national ocean policy.

The major problems noted were:

--The lack of a single manager of all U.S. oceanographic vessels.

--The lack of uniform vessel acccounting standards.

--The lack of coordination within the Department of the Navy.

--Ineffective management of NOAA's vessel activities.

Need for a single manager of all U.S. oceanographic vessels

Because their is no single manager or department responsible for the management of the Nation's oceanographic vessels there is no formal system to assess and determine the necessary level of vessel operations or to plan for the replacement, upgrading, or retrofit of oceanographic vessels. Each agency operating oceanographic vessels is concerned only with satisfying its own mission needs without regard for national needs.

The ocean science community recognized this problem, and in 1975 the Chairman of the Federal Council for Science and Technology requested the Center for Naval Analysis (CNA) to study the projected adequacy of the U.S. ocean science assets for Federal oceanic programs.

The subsequent CNA report entitled "The Capital Structure For Ocean Science," dated March 1975, pointed out that:

--Because of the lack of ship operating funds, federally operated vessels were underutilized, and optimal utilization levels should be developed and maintained.

--The lack of a systematic program for planning vessel replacements could mean serious shortfalls in the 1980s, when a number of federally owned ships will be retired.

--Given the leadtime involved in replacing retired vessels, the conversion of existing hulls and/or leasing may help meet increased vessel demand.

Our analysis of the data supports the earlier CNA findings; therefore, we conclude that these same problems still exist. We compared several groups of oceanographic vessels of comparable size and capabilities from Navy, NOAA, and the academic fleet, and found that NOAA's vessels were underutilized and that economies could have been achieved by increasing their days at sea. We also noted that academic vessels had ship days available as a result of funding deficiencies.

On the basis of agency projections and our analysis of the current overall condition of U.S. vessels, we believe that there will be a need to replace many oceanographic vessels in the 1980s. Given the leadtime involved in replacing vessels, we agree with the CNA recommendation that converting existing hulls and/or leasing may help meet vessel demand.

To guarantee effective management and use of Federal vessels, a single manager or a formally coordinated group of vessel managers from the agencies involved should be appointed. This manager or group of managers could assess and determine total U.S. oceanographic needs on the basis of the requirements of all marine science and oceanographic programs managed within the respective agencies. This would also ensure that a replacement policy and efficient procedures for sharing vessel assets could be developed.

Because of agency accounting inconsistencies, however, it would be difficult for a Government-wide manager or managers to determine the efficiency and economy of various vessels without first establishing uniform accounting standards.

Need to establish uniform vessel accounting standards

Cost is a major consideration in evaluating most Government operations, and oceanographic vessel operations are no exception. If derived benefits and vessel efficiency are to be determined from associated costs, then it is imperative that agencies properly identify what costs are associated with operating their oceanographic vessels. There should be enough similarity among the various agency systems to allow for reasonable cost comparisons.

We found that each activity operating federally owned or funded oceanographic vessels used a different standard for defining and accounting for vessel days at sea and for determining the associated cost per day, and that these different standards could distort realistic cost comparisons. For example, when we reviewed the records at NSF we found that there were no accounting guidelines for comparing costs among

the various academic institutions. Our analysis also showed that one agency had understated vessel costs by at least 39 percent or $1,500 a day for 2 fiscal years. This resulted from excluding personnel and equipment costs for some projects.

Therefore, the vessel costs per day listed in table 2 on pages 15 and 16 could be unrealistic for comparison purposes because of the different methods agencies use to determine costs.

We believe a uniform accounting standard that would classify and account for all direct and indirect vessel costs should be established. This standard could provide cost comparability on an item-by-item basis and also for total vessel operating costs. For example, crew salaries and fringe benefits could be accounted for under one cost category, while costs such as equipment, fuel, and maintenance would be accounted for under other cost categories.

With the exception of NSF, all the agencies involved agreed that uniform vessel accounting standards should be designed and implemented. NSF stated that as a matter of policy they do not develop accounting guidelines for federally supported academic vessels, but rely upon the Office of Management and Budget to set policy and procedures on cost determination for university grantees. We disagree with NSF's policy and believe that use of uniform accounting standards could help vessel managers determine which vessel or vessels are most economical and efficient for various oceanographic programs.

Need for better coordination of oceanic activities within the Navy

The Navy's oceanographic program is divided into three functional areas: ocean science, ocean engineering, and oceanographic operations, which includes environmental prediction services. While these functional areas are concerned primarily with the Navy's national security role, they are also an important part of the overall Federal oceanographic effort. Because the Navy is involved in most aspects of ocean research, it makes major contributions to the total Federal effort, and therefore inherently shares the responsibility for the increasing Federal civil and military activities.

In 1975, the Secretary of the Navy issued a directive to consolidate the naval oceanographic program and its resources under a single manager--the Oceanographer of the Navy--and to integrate it with other national oceanographic efforts. The purpose of this was to ensure that Navy

oceanographic programs would be as economic and efficient as possible and would cooperate with other Federal agencies in understanding and exploiting the oceans, coasts, and seabeds for economic, scientific, social, and political gains. This directive, however, has never been fully implemented.

During our review of the Navy's oceanographic program we found that there was no centralized management or coordination for Department of the Navy ocean programs. As a result, there often is inefficient and uncoordinated program and vessel management.

For example, funding was provided to the Naval Oceanographic Office, the Naval Research Laboratory, and the Naval Oceanographic Research Development Activity for acoustic propagation research and studies as part of the Navy's antisubmarine warfare effort. We were informed by the Director of one of the Navy's classified operational activities that because of the lack of acoustic propagation support within the Navy, he contracted with an industrial firm.

In another instance, Navy scientists at the Naval Oceanographic Office and Naval Oceanographic Research Development activity designed an efficient and economical antisubmarine warfare magnetic anomaly detection filter for use in classified operations. According to Navy officials, test results from previous research indicated that this particular technique and filter design was ideal for operational use. Documents we reviewed indicated that Navy operational units requested additional procurement and testing; however, because funding was being used for testing other techniques in another Navy command, the project was stopped.

We also noted that even though the Oceanographer of the Navy is designated as the central manager for all oceanographic vessels and resources, the Navy Research Laboratory, still under the authority of the Office of Naval Research, continues to use basic research and development funds for an expensive ocean research vessel, the USNS Hayes, while vessel resources and funding deficiencies existed for higher priority defense related oceanographic operations.

The Vice Chief of Naval Operations, in September 1977, directed that an evaluation be made of the naval oceanographic program. A resulting Navy study pointed out that oceanography within the Department of the Navy was not coordinated and cited a Naval Audit Report that described the naval oceanographic program as fragmented. We agree with these findings and believe that all naval oceanographic functions should be consolidated under a single manager.

Need for improving NOAA's vessel management

We found that there are no reviews of the oceanographic research/survey projects being planned or conducted by Federal agencies or universities outside of the Department of the Navy. Officials agreed that although there is informal coordination, there is a potential for duplication of effort.

We also found in at least two instances that high cost vessels were assigned to projects that are normally assigned to low cost vessels. NOAA officials said that because of higher priority work and ship maintenance requirements, the less costly vessels were unavailable. The more expensive vessels, however, were used without attempting to obtain more economical vessels from other agencies or the private sector.

Further examination of NOAA vessel operations revealed that NOAA program managers were leasing vessels without the knowledge of NOAA's Office of Fleet Operations. When we questioned Office officials about NOAA's lease and charting costs, they could only provide us with a "best estimate" of these costs. We believe this results from the lack of effective centralized control over vessel operations within NOAA. We noticed that a NOAA circular dated July 25, 1974, required program managers to coordinate vessel leasing but when we questioned several managers, they stated they were unaware of this directive. One manager indicated that he would not request vessel time as long as they have their own funds for vessel leasing.

In commenting on our findings, NOAA officials stated that not knowing other agencies' project plans and operations for vessels is a common problem, as is the use of high cost vessels on projects that could be assigned to low cost vessels. These officials also stated, however, that NOAA is prepared to work with other Federal agencies for more efficient vessel management in the Nation's oceanographic programs.

In regard to NOAA's management of vessel leasing and charters, NOAA officials said that they recently completed a review of this problem and have issued a new directive in an attempt to better control vessel leasing and charter management.

TABLE 1

FEDERALLY FUNDED U.S. OCEANOGRAPHIC VESSELS AND RELATED CAPABILITIES

Agency/Institution Operating Vessel	Vessel length (feet)	Vessel Name	Age of Vessel (in Years)	Condition	Desired Retirement[2]	SPECIAL CAPABILITIES[1]					
						Mapping and Charting	Polar Operation	Controlled Positioning	Submersible Handling	Fisheries Research	Van Capable
National Oceanic & Atmospheric Admin. (NOAA)	303'	Oceanographer	12	Excellent	1990	X					
	303'	Discover	12	Excellent	1990	X					
	278'	Researcher	8	Excellent	1994	X					
	242'	Surveyor	18	Fair/Good	1984	X					
	231'	Fairweather	10	Excellent	1992	X					
	231'	Rainier	10	Excellent	1992	X					
	215'	Miller Freeman	11	Excellent	1992					X	
	231'	Mt. Mitchell	11	Excellent	1991	X					
	163'	Peirce	15	Good	1986	X					
	163'	Whiting	15	Good	1986	X					
	175'	McArthur	12	Excellent	1989	X					
	175'	Davidson	11	Excellent	1990	X					
	170'	Oregon II	11	Excellent	1991					X	
	177'	George B. Kelez	34	Poor	1979						
	187'	Albatross II	16	Good	1985					X	
	164'	Townsend Cromwell	15	Good	1986					X	
	171'	David Starr Jordan	13	Excellent	1987					X	
	156'	Delaware II	10	Good	1991					X	
	133'	Ferrel	10	Excellent	1991						
	3/90'	Ruće/Heck	12	Excellent	1987						
	100'	Oregon	32	Poor	1979					X	
	94'	John N. Cobb	28	Good	4980					X	
	86'	Murre II	35	Poor	1980					X	
		George Bowers	23	Retired	Retired 12/6/76						
University National Oceanographic Laboratory System (UNOLS)	245'	Melville	8	Good	1999			X			
	245'	Knorr	5	Good	2000			X			
	210'	Atlantis II	15	Fair/Good	1993						
	209'	Thomas Washington	13	Fair/Good	1995						
	209'	Thompson	13	Fair/Good	1995						
	208'	James M. Gilliss	16	Good	1992						
	208'	Robert D. Conrad	16	Poor/Fair	1983						
	197'	Vema	55	Fair	1980						
	177'	Oceanus	3	Excellent	2000						
	177'	Wecoma	2	Excellent	2001						
	177'	Endeavor	2	Excellent	2001						
	172'	Moana Wave	5	Excellent	2003						X
	172'	Gyre	5	Good/Excellent	2003						
	170'	Columbus Iselin	7	Excellent	2002						X
	156'	Kana Keoki	11	Fair	1988						X
	133'	Alpha Helix	13	Fair/Good	1988						
	118'	Eastward	11	Fair/Good	1988						
	110'	Velcro IV	30	Fair	1983						
	106'	Ridgely Warfield	11	Good	1993						
	95'	Ellen B. Scripps	13	Good	1992						
	85'	Acona	17	Fair/Good	1988						
	80'	Cayuse	10	Good	1993						
	80'	Longhorn	8	Good	1990						
	72'	Blue Fin	6	Fair/Good	1985						
	65'	Hoh	35	Poor	1978						
	65'	Onar	24	Poor	1980						
	65'	Maury	28	Poor	1980						
	64'	Calanus	8	Excellent	1990						

TABLE 1

FEDERALLY FUNDED U.S. OCEANOGRAPHIC VESSELS AND RELATED CAPABILITIES

Agency/Institution Operating Vessel	Vessel length (feet)	Vessel Name	Age of Vessel (in Years)	Condition	Desired Retirement 2/	SPECIAL CAPABILITIES 1/					
						Mapping and Charting	Polar Operation	Controlled Positioning	Submersible Handling	Fisheries Research	Van Capable
U. S. Navy/Military Sealift Command (MSC)	246'	Hayes	7	Excellent	1991						
	455'	Bowditch	33	Poor	-	X					
	455'	Dutton	33	Poor	1978	X					
	563'	Hess	13	Excellent	1985	X					
	285'	Wyman	7	Excellent	1996	X					
	393'	Harkness	7	Excellent	1996	X					
	393'	Chauvenet	8	Excellent	1996	X					
	285'	Bent	13	Good	1992	X					
	285'	Kane	12	Good	1992	X					
	285'	Wilkes	7	Excellent	1996	X					
	208'	Bartlett	9	Good	1994						
	208'	De Steiguer	9	Good	1994						
	208'	Lynch	13	Good	1993						
	262'	Mizar	21	Good	1983		X	X			
	455'	Kingsport	34	Fair	1986						
	370'	Myer	32	Fair	1994						
	370'	Neptune	32	Fair	1995						
	438'	Aeolus	33	Fair	1984						
United States Coast Guard (USCG) 4/	180'	Evergreen	35	Fair	1985		X				
	3/213'	Acushnet	35	Fair	1985		X				
	269'	Northwind	33	Good	1987		X				
	269'	Westwind	33	Good	1985		X				
	269'	Burton Island	33	Good	1978		X				
	309'	Glacier	24	Good	1985		X				
	399'	Polar Star	2	Excellent	2000		X				
	399'	Polar Sea	2	Excellent	2000		X				
Dept.of Interior U.S. Geological Survey	180'	Sea Sounder	34	Good	-						
	205'	Samuel Lee	10	Excellent	1993	X					
	96'	Polaris	49	Fair	1979						

1/ Capabilities which cannot be readily added to an existing ship.

2/ Based on data collected by Center for Naval Analysis in a study dated March, 1975.

3/ Two ships utilized simultaneously for wire drag obstacle surveys.

4/ All USCG vessels except the Evergreen are icebreakers which are used by other Federal agencies when available for polar related research.

5/ No longer used for oceanographic research purposes.

TABLE 2

COST & UTILIZATION OF FEDERALLY FUNDED U.S. OCEANOGRAPHIC VESSELS
1976-1977-1978

Agency/Institution Operating Vessel	Vessel Name	Operating Days 1/ 1976 (Actual)	1977 (Estimated)	1978 (Projected)	Vessel Cost Per Day 2/ 1976 (In thousands)	1977 (In thousands)	1978 (In thousands)
National Oceanic & Atmospheric Admin. (NOAA)	Oceanographer	181	172	180	11.6	13.8	14.5
	Discover	187	207	210	12.9	13.1	13.2
	Researcher	182	198	210	11.0	11.6	12.4
	Surveyor	193	220	210	12.1	10.8	12.6
	Fairweather	183	189	180	9.3	8.7	11.6
	Rainier	191	187	180	9.0	9.7	11.6
	Miller Freeman	192	248	250	7.8	6.4	7.5
	Mt. Mitchell	186	199	190	9.8	11.3	10.9
	Peirce	193	189	188	5.0	5.7	6.1
	Whiting	195	195	188	5.3	6.0	6.2
	McArthur	206	191	188	5.7	6.5	7.1
	Davidson	191	191	188	7.2	7.0	6.5
	Oregon II	221	244	250	2.9	3.0	3.4
	George B. Kelez	[illegible]	194	200	3.6	4.5	4.6
	Albatross II	19[illegible]	207	215	5.2	6.2	5.2
	Townsend Cromwell	187	249	250	3.5	3.7	3.4
	David Starr Jordan	203	245	250	3.0	3.8	3.8
	Delaware II	171	235	215	3.8	3.7	4.3
	Farrel	190	195	190	2.4	3.6	3.6
	Rude/Heck	364	336	380	1.6	2.5	2.0
	Oregon	184	197	189	1.8	1.8	2.3
	John N. Cobb	172	168	166	1.8	2.2	2.7
	Murre II	133	129	140	.9	1.2	1.5
	George M. Bowers	139	99	Retired	.8	.6	Retired
University National Oceanographic Laboratory System (UNOLS)	Melville	188	249	308	5.6	6.8	6.6
	Knorr	304	294	329	4.5	5.3	5.5
	Atlantis II	351	304	300	5.5	6.3	6.6
	Thomas Washington	219	240	292	5.1	5.8	5.3
	Thompson	195	196	255	5.4	5.9	5.5
	James M. Gilliss	253	211	238	3.9	5.7	5.5
	Robert D. Conrad	281	240	321	5.2	5.7	4.5
	Vema	309	325	300	3.1	2.8	3.9
	Oceanus	188	255	274	3.0	3.4	3.6
	Wecoma	143	251	225	3.2	3.9	4.2
	Endeavor	-	221	276	-	3.7	3.7
	Moana Wave	297	365	321	2.9	2.3	2.8
	Gyre	280	275	270	3.2	3.8	3.8
	Columbus Iselin	243	254	253	2.8	3.2	3.5
	Kana Keoki	261	259	311	3.3	3.6	3.0
	Alpha Helix	240	232	285	3.5	3.9	3.5
	Easward	298	225	353	2.0	2.5	2.5
	Velero IV	189	209	210	2.5	2.3	2.4
	Ridgely Warfield	117	150	180	3.3	2.0	1.9
	Ellen B. Scripps	112	174	191	2.0	2.6	2.1
	Acona	198	190	187	2.7	3.3	3.5
	Cayuse	111	194	200	2.0	2.0	2.0
	Longhorn	199	230	230	1.1	1.1	1.2
	Blue Fin	104	207	210	1.5	.6	.6
	Hoh	148	152	156	.5	.4	.4
	Onar	177	227	218	.7	.5	.6
	Maury	56	80	90	.8	.9	.8
	Calanus	182	190	234	.7	.8	.7

TABLE 2

COST & UTILIZATION OF FEDERALLY FUNDED U.S. OCEANOGRAPHIC VESSELS
1976-1977-1978

Agency/Institution Operating Vessel	Vessel Name	Vessel Operating Days 1/ 1976 (Actual)	1977 (Estimated)	1978 (Projected)	Vessel Cost Per Day 2/ 1976 (In thousands)	1977 (In thousands)	1978 (In thousands)
U.S. Navy/Military Sealift Command(MSC)	Hayes	247	163	210	9.9	14.4	17.6
	Bowditch	209	102	260	18.5	40.5	16.6
	Dutton	113	172	230	45.2	24.0	17.1
	Hess	-	-	168	-	-	34.7
	Wyman	189	244	168	11.8	12.3	20.3
	Harkness	112	264	234	19.8	13.2	16.1
	Chauvenet	250	248	280	12.0	14.4	14.8
	Bent	207	206	230	10.6	13.2	13.4
	Kane	213	242	230	11.3	10.9	14.9
	Wilkes	29	271	230	98.0	10.3	16.5
	Bartlett	231	192	192	8.5	10.6	13.5
	De Steiguer	212	234	179	7.6	8.4	13.5
	Lynch	232	168	217	7.6	11.6	12.1
	Miser	171	221	218	14.3	12.1	13.4
	Kingsport	229	272	188	13.2	12.3	22.3
	Myer	241	245	-	15.1	16.9	-
	Neptune	185	251	196	18.4	15.8	26.2
	Aeolus	143	116	218	33.7	49.2	26.5
United States Coast Guard (USCG)	Evergreen	164	183	192	4.7	4.3	4.5
	Acushnet	139	189	171	5.5	5.4	8.2
	Northwind	159	202	181	15.0	15.4	18.8
	Westwind	159	202	181	15.0	15.4	13.3
	Burton Island	159	202	181	15.0	15.4	11.8
	Glacier	223	157	146	16.9	36.2	36.3
	Polar Star	-	-	126	-	-	-
	Polar Sea	-	-	126	-	-	-
Dept. Of Interior U.S. Geological Survey	Sea Sounder	113	163	174	7.6	11.1	6.9
	Samuel P. Lee	185	193	179	7.6	7.7	7.8
	Polaris	100	180	85	1.3	2.0	2.5

1/ Based on available data furnished from the various agencies which use different accounting systems. (See page 14.)

2/ Based on available data furnished from the various agencies which use different accounting systems. (See page 14.)

3/ Two ships utilized simultaneously for wire drag obstacle surveys.

CHAPTER 3

COMPARATIVE ANALYSIS OF U.S. AND FOREIGN OCEANOGRAPHIC CAPABILITIES

For the 20 years following World War II, the U.S. Navy provided the principal worldwide support and leadership for ocean programs in both ocean science and engineering. The Navy's program was essentially the U.S. national program.

Beginning in 1950 other agencies, such as NSF, established ocean science programs, reducing the need for the Navy to support similar efforts. While this was taking place, other national priorities such as the "space race" between the Soviet Union and the United States began to draw attention and support away from the developing national ocean program. Hence, the United States while maintaining Federal oceanic activities, does not have a well coordinated and comprehensive national ocean policy or program. In contrast--because scientific and technological advances since World War II have demonstrated that the world's oceans are a major exploitable source for living and nonliving resources such as fish, oil, and metals--other major foreign maritime nations have expanded their national efforts in ocean science and engineering and have coordinated comprehensive national ocean policies and programs.

SOVIET OCEANS DEVELOPMENT

The Soviet Union, some 20 years ago, recognized the importance of the oceans as a source of animal protein and raw materials, and the economic value of the merchant marine in an era of expanding trade. It also recognized the political and national security (strategic) value of the oceans. Accordingly, a carefully designed ocean policy was established. Measured in terms of scientific personnel and oceanographic vessels, the United States was the world's leader in oceanography until the early 1960s when the Russian program of expansion got well underway. In 1964, a delegation of American scientists visiting the Soviet Union reported that the Soviets were operating oceanographic survey ships of 50,000 tons compared with 60,000 tons in the United States and there were only 700 Soviet scientists compared to 1,500 in the United States.

By 1974, the number of ocean scientists and supporting technicians in the United States totaled between 2,000 and 3,000, while the Soviet Union was estimated to have between 7,000 and 8,000. Experts pointed out that the real difference is in the number of Soviet technicians; the number of

scientists in the two countries may not differ very much if at all. However, when comparing the relative strength of the two countries with worldwide oceanographic capabilities, the Soviet Union is known to have built over 200 oceanographic vessels, including 70 vessels of over 1,000 gross weight tons, compared to 39 built by the United States. Further, experts indicate that the Soviet Union has continued to improve its oceanographic resources with construction of new ships, qualitative improvements in its research fleet, and continued influx of trained oceanographic technicians to supplement their trained scientists.

According to the ocean science community, however, the Soviet Union is known to be behind the United States in instrumentation technology, a vital part of oceanography that enables scientists to collect and interpret data. Also, Russian oceanographers do not have sophisticated ship borne computers and other advanced ocean science equipment. One American scientist who worked aboard a Soviet oceanographic vessel during a joint U.S./U.S.S.R. program said that the Russians need oceanographic instrumentation technology and want such joint efforts so that they can obtain and use American made oceanographic instrumentation.

The one area in which the Soviets clearly surpass the U.S. oceanographic effort is polar research. The Soviet Union has at least four arctic stations with scientific personnel supported by a number of polar research ships. In contrast, the United States occasionally supports one arctic ice flow station and has only one ship committed to polar research.

Hydrography is another area where Soviet ocean capabilities are expanding. According to the International Hydrographic Organization Annual Yearbook for 1978, the Soviets possess a fleet of 60 hydrographic vessels as compared to 21 possessed by the United States.

In summary, it appears that the remarkable oceanographic accomplishments of the Soviet Union have come about from a comprehensive national ocean policy and program. Experts point out that Soviet achievements are the result of clearly defined objectives and coordination and centralization at high organizational levels in the Government and the party. In contrast, responsibility for ocean science activities in the United States are widely scattered and often uncoordinated. In spite of the massive Soviet effort, however, most experts agree that the quality of U.S. oceanographic research is superior.

FRENCH AND UNITED KINGDOM OCEANS DEVELOPMENT

The United Kingdom and France are also dependent on ocean resources, and have also recognized the importance of oceanic affairs and world competition involved in the exploration and exploitation of marine resources.

In 1967, the French Government, in implementing a comprehensive ocean policy and program, created a National Center for the Exploitation of the Oceans (CNEXO). Before CNEXO was created, France had more than 100 laboratories, activities, and services individually concerned with oceanography. To avoid program duplication or fragmentation, the French Government created CNEXO to coordinate all of its oceanographic efforts, including oceans policy, oceanographic vessel management, ocean program development and management, and the training of scientists and engineers in ocean exploration.

We noted that CNEXO is responsible for managing all French civilian oceanographic vessel operations. Through centralized management they have achieved an average of over 275 days at sea for their ships, thereby achieving an optimal vessel utilization rate. On the basis of data we were given, their vessel costs are similar to the costs of U.S. vessels that have high utilization rates.

We found that while the French Navy does not have ocean programs comparable in size and scope to those of the United States, all oceanographic vessels and programs are managed by the French Navy Hydrographer.

In 1965, the British established the Natural Environmental Research Council, which is similar to CNEXO. The council is responsible for all civilian scientific activities in the United Kingdom, and like CNEXO, it manages all the British civilian oceanographic vessels. Their vessel utilization rates are also efficient, averaging over 260 days a year with costs that are comparable to U.S. oceanographic ships.

We found that the British also had centralized management of their defense oceanic efforts under the British Hydrographer.

In contrast to some foreign powers, the United States, while maintaining some of its leadership role in the oceangraphic areas, needs to improve the effectiveness of its ocean programs through better management. While foreign oceanic management successes do not necessarily imply a need for restructuring U.S. oceans management along the same lines, we believe that the United States could better use its oceanic resources through a unified national ocean program.

Ocean policies or the lack thereof could have repercussions on future international relations. Ocean science experts in several international organizations pointed out that developing countries do not have oceanographic or hydrographic capabilities, and to adequately generate economic development, avoid maritime shipping casualties, and maintain pollution control they will need to establish oceanographic programs. Thus, the United States will probably want to maintain the capability to help countries desiring assistance in the oceanographic area.

CHAPTER 4

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The lack of a coordinated and definitive national ocean policy and the proliferation of ocean related programs and vessels together with the rapid growth of ocean users has led to continued fragmentation of ocean affairs and functions. As a result, the United States is in a position of relative decline in oceanographic vessel resources.

For many years agencies have been concerned with meeting their individual oceanographic vessel needs. This has provided little incentive for individual agencies to communicate and coordinate with each other about vessel operations. As vessel usage and cost has increased, there has been little change in the agencies' attitudes.

Our review of the Nation's oceanographic fleet clearly shows that managing and operating ocean research/survey vessels is still highly decentralized throughout the Federal Government. In fact, each agency continues to operate independently with no overall Government-wide guidance. There is also only a very limited review of oceanographic vessel operations outside the individual agencies. At the same time, there are no formal or systematic plans to assess and determine the necessary levels of vessel operations or to determine the level of needed oceanographic vessel assets for an overall U.S. national program.

Further, incomplete and inadequate vessel accounting standards make it difficult to determine and compare vessel costs for similar services from agencies and commercial sources. Hence, it is difficult to determine how and by whom oceanographic vessels should be operated to ensure efficiency and economy to the Government.

We believe this fragmented and decentralized use of oceanographic vessels has created a lack of overall management control and contributed to inefficient and uneconomical use of the Nation's ocean research/survey fleet.

Agencies operating oceanographic research vessels agree that more effective use of oceanographic resources should be accomplished. They disagree, however, with the concept of centralized management because of differing agency missions and oceanographic programs. We believe that by addressing these problems from a Government-wide view point rather than independently, the Congress would be able to better determine

what the Nation's vessel requirements are and how best to satisfy such requirements economically and efficiently until a comprehensive U.S. national ocean policy is developed. The Congress would also be aware of where the United States strengths and weaknesses are in oceanographic assets and capabilities.

RECOMMENDATIONS

Until a comprehensive national ocean policy is established, we recommend that the Congress designate a single manager for coordinated and efficient Government-wide civilian agency oceanographic vessel operations. This manager should have the authority to insure that:

--Uniform operations policies and procedures are established for monitoring all oceanographic vessel activities so that priority needs are met and duplication of efforts are avoided.

--Effective management and use of existing vessels is accomplished to avoid unnecessary construction of new vessels.

--All viable alternatives, such as leasing or conversion of old hulls are considered before authorizing new vessel construction.

--Standardized and uniform vessel accounting procedures are established and maintained.

An alternative choice to a single manager would be a Government-wide Fleet Allocation Council which would be made up of oceanographic vessel managers from the agencies that operate oceanographic ships, and which would have the same authority as a single manager.

We also recommend that:

--The Secretary of Defense direct the Secretary of the Navy to reorganize and consolidate management of all Navy oceanographic activities under the Oceanographer of the Navy or another designated single manager, and to assist and improve coordination with the designated civilian manager to maximize use of all U.S. oceanographic vessels.

--The Secretary of Commerce direct the Administrator, NOAA, to review NOAA's vessel operations policies to ensure that vessels are used as economically and efficiently as possible.

APPENDIX I

U.S. House of Representatives
Committee on
Merchant Marine and Fisheries
Room 1334, Longworth House Office Building
Washington, D.C. 20515

January 9, 1978

The Honorable Elmer B. Staats
Comptroller General of the
United States
General Accounting Office
441 G Street
Washington, D.C. 20548

Dear Mr. Staats:

I am aware that GAO is currently undertaking a study on the degree of coordination of the United States' ocean survey fleet. The Subcommittee on Oceanography is planning in this session of Congress to conduct oversight hearings on our Nation's oceanographic fleet capability.

As a first step in our investigation, a somewhat expanded version of the current GAO study would be most helpful. I would like a detailed inventory of United States' oceanographic vessels including the age of the vessels and the replacement policy or any existing or anticipated proposals for replacement, retrofitting or upgrading of these vessels.

Further, I would like to know what the current and projected time demands are on these vessels and a description of the operating costs. Perhaps the latter analysis could best be done on an agency basis in order to reflect the various manning requirement and the effects of having to utilize various manning requirements. Also, I am interested in the general procedure for obtaining vessel time from the different agencies.

Finally, a comparison of the U.S. oceanographic fleet capability with other major countries with survey fleets would be useful. Specifically, a comparison between the U.S. and Soviet oceanographic fleets is of interest.

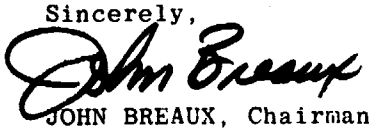
APPENDIX I

I understand that the nature of some of the above information would warrant classification. If possible, I would appreciate the segregation of those portions of the study that necessitate classification so that the unclassified information could be used in a public hearing.

Because of your busy schedule and our time requirements, I am requesting a "white paper" in lieu of the more formal "blue" report. This paper would have its greatest value to the Subcommittee if we could have it by May 1. During its preparation, I would appreciate receiving any completed portions of the study.

Thank you for your cooperation. If you need any further information, please contact G. W. Smith on the Subcommittee staff, 225-7508.

Sincerely,



JOHN BREAUX, Chairman
Subcommittee on Oceanography

JB/bf

APPENDIX II

FEDERAL ACTIVITIES INVOLVED IN OCEANIC AFFAIRS

Department of Commerce:
- National Oceanic and Atmospheric Administration
- Maritime Administration

Department of Transportation:
- Coast Guard
- Office of Pipeline Safety

Department of Defense:
- Department of the Navy
- Defense Mapping Agency
- Defense Advanced Research Projects Agency
- Department of the Army, Corps of Engineers

Department of the Interior:
- Fish and Wildlife Service
- National Park Service
- Geological Survey
- Bureau of Land Management
- Bureau of Mines
- Bureau of Outdoor Recreation
- Office of Saline Water
- Office of Water Resources Research
- Office of Territorial Affairs
- Bureau of Indian Affairs
- Bureau of Reclamation

National Science Foundation

Environmental Protection Agency

Department of State

Department of Health, Education, and Welfare:
- Food and Drug Administration
- National Institutes of Health
- Office of Education

Atomic Energy Commission

National Aeronautics and Space Administration

Smithsonian Institution

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