REPORT TO THE CONGRESS

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Coordinating Deep-Ocean Geophysical Surveys Would Save Money B-133188

National Oceanic and Atmospheric Administration

Department of Commerce
Department of the Navy

BY THE COMPTROLLER GENERAL OF THE UNITED STATES

DEC. 8, 1971

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

B-133188

To the President of the Senate and the
Speaker of the House of Representatives

This is our report on the feasibility of coordinating the deep-ocean geophysical surveys of the National Oceanic and Atmospheric Administration, Department of Commerce, and the Department of the Navy.

Our review was made pursuant to the Budget and Accounting Act, 1921 (31 U.S.C. 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

Copies of this report are being sent to the Director, Office of Management and Budget; the Secretary of Commerce; and the Secretary of Defense.

Comptroller General
of the United States

COMPTROLLER GENERAL'S REPORT TO THE CONGRESS

COORDINATING DEEP-OCEAN GEOPHYSICAL SURVEYS WOULD SAVE MONEY

National Oceanic and Atmospheric Administration, Department of Commerce
Department of the Navy B-133188

D I G E S T

WHY THE REVIEW WAS MADE

During a survey of Federal oceanographic activities, the General Accounting Office (GAO) noted that the National Oceanic and Atmospheric Administration, Department of Commerce, and the Department of the Navy were planning to conduct deep-ocean geophysical surveys of the same areas. This review was undertaken by GAO to see whether it would be feasible for the Administration and the Navy to coordinate their efforts and to determine what benefits might result.

FINDINGS AND CONCLUSIONS

The Federal Government could save $20 million by the early 1980's if the deep-ocean geophysical surveys to be conducted by the Administration and the Navy are effectively planned and coordinated. Although both agencies are aware of the other's geophysical surveying activities, they do not have any formal mechanism for coordinating the surveys. (See p. 17.)

The long-range plans of the Administration and the Navy provide for obtaining geophysical data in the same areas (some 16 million square miles) of the Atlantic and Pacific Oceans. (See maps on pp. 15 and 16.)

The Navy's geophysical surveys could be eliminated in most cases if the Administration, which performs more extensive surveys, would provide the Navy with the data it requires. (See p. 11.)

The data obtained by the Administration would satisfy most Navy requirements if Administration ships were provided with additional equipment at a cost of only $360,000. (See pp. 13 and 17.)

Administration and Navy officials informed GAO that no formal action had been taken to implement coordination because the geophysical survey programs were relatively new. Officials from the Office of Management and Budget, which is responsible for coordinating Federal survey programs, said that, because of the relatively small size of the programs, no effort had been made to review them. (See p. 20.)

RECOMMENDATIONS OR SUGGESTIONS

The Secretary of Commerce and the Secretary of the Navy should

--ensure that the plans being formulated by their departments result in effective coordination of the deep-ocean geophysical survey programs and

--explore the possibility of coordinating other marine science activities. (See p. 25.)

AGENCY ACTIONS AND UNRESOLVED ISSUES

The Administration agreed that there was a need to ensure coordination in the planning of surveys and said that it had exchanged correspondence with the Navy regarding the establishment of liaison officers and staffs for coordinating geophysical surveys. (See p. 23.)

The Navy stated that it strongly endorsed the GAO proposals concerning effective coordination of Navy and Administration programs. It said that the determination of the most efficient means of achieving this coordination had been the subject of discussion and correspondence between the Navy and the Administration from October 1970.

The Navy commented that an agreement in principle had been reached on the exchange of personnel, which would ensure maximum effective coordination of the planning and scheduling of geophysical surveys. According to the Navy this will facilitate the coordination of marine science activity of both agencies. (See p. 24.)

GAO believes that the actions taken by the Administration and the Navy are an important first step. Survey specifications and administrative procedures, however, must be established, evaluated, and jointly agreed upon before effective coordination can be accomplished. (See p. 24.)

MATTERS FOR CONSIDERATION BY THE CONGRESS

This is an example of how programs producing similar types of information but conducted by different Federal agencies need to be coordinated, to avoid unnecessary duplication and cost.

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CHAPTER 1

INTRODUCTION

The activities discussed in this report are geophysical surveys conducted as part of the National Oceanic and Atmospheric Administration's Scientific Exploration and Mapping Program and the Navy's Antisubmarine Warfare/Undersea Warfare Survey Project (Antisubmarine Warfare Survey). The measurements obtained in these surveys are a source of valuable information for the scientific community in its quest for understanding the earth's processes and at the same time support Navy weapon systems which must operate in the deep oceans.

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION DEPARTMENT OF COMMERCE

The Administration was established on October 3, 1970, by consolidating the Environmental Science Services Administration with elements and programs of other Federal organizations that had marine science responsibilities, in accordance with the provisions of Reorganization Plan No. 4 of 1970. This reorganization was in response to a recommendation made to the President and the Congress by the Commission on Marine Science, Engineering, and Resources in a 1969 report entitled "Our Nation and the Sea -- A Plan for National Action."

The mission of the Administration is to improve the understanding of the sea's resources and permit their development, to achieve a more comprehensive understanding of oceanic and atmospheric phenomena, and to facilitate cooperation between public and private interests. The National Ocean Survey, a major component of the Administration, conducts geophysical surveys in support of the Administration's mission.

OFFICE OF THE OCEANOGRAPHER OF THE NAVY

The Oceanographer of the Navy commands the Office of the Oceanographer of the Navy, which is a shore activity

under the command and support of the Chief of Naval Operations. The Oceanographer of the Navy is the Naval Oceanographic Program Director and is responsible for exercising centralized authority, direction, and control to ensure an integrated and effective naval oceanographic program. Also the Oceanographer of the Navy exercises military control over the Commander of the U.S. Naval Oceanographic Office.

The U.S. Naval Oceanographic Office, Suitland, Maryland, was established by the Congress (10 U.S.C. 7391) to provide the Department of the Navy with oceanographic and navigational data and to perform or recommend related research, development, testing, and evaluation. Also the Oceanographic Office performs the operational survey portion of the naval oceanographic program and exchanges oceanographic, hydrographic, magnetic, geodetic, gravity, and cartographic information with other departments and agencies of the Government. The activities of this Office are financed primarily from Navy appropriations.

CHAPTER 2

COMPARISON OF GEOPHYSICAL SURVEY PROGRAMS

The geophysical surveying activities of the Administration and the Navy are performed to meet different needs. The data obtained in the Administration's Scientific Exploration and Mapping Program are intended to provide a greater understanding of the deep oceans and their processes, which will eventually lead to the economic recovery and management of deep-ocean resources. The Navy's program is conducted primarily for military purposes as part of its Antisubmarine Warfare/Undersea Warfare Survey Project. The programs of the two agencies are discussed below.

ADMINISTRATION GEOPHYSICAL SURVEYS

The Administration's Scientific Exploration and Mapping Program was initiated in response to a recommendation by the National Academy of Sciences-National Research Council's Committee on Oceanography. In a 1960 report, entitled "Oceanography 1960 to 1970," this Committee recommended that a new program of systematic oceanwide surveys be undertaken. The report suggested that the responsibility for these surveys be divided among interested nations and that the United States carry out about 30 percent of the overall program.

The Administration separates the surveys of this program into two phases--oceanographic and geophysical. During the oceanographic phase data are obtained while a ship is in a stationary position and include measurements of water temperature and salinity and the collection of core and dredge samples. These station measurements are conducted at a time other than when the geophysical measurements are obtained. We were informed by the Administration, however, that the oceanographic phase of the program was not being conducted because of insufficient funding.

During the geophysical phase data are obtained that delineate bottom topography and describe the ocean floor for scientific purposes. These data are obtained while a ship is under way and include measurements of bathymetry,

magnetics, gravity, and seismic profiles.[1] (See illustration on p. 7.) The measurements are run concurrently and continuously on a systematic parallel gridline pattern, and the tracklines (survey lines) are spaced at 10-mile intervals.

The initial surveys for the geophysical phase began in 1961 and have continued sporadically. The original area to be covered was about 1.9 million square miles in the North Pacific Ocean between Hawaii and Alaska. In this area the Administration has completed geophysical surveys covering about 1.5 million square miles within the 18-percent area discussed below.

In 1968 the project area was expanded for planning purposes, and it now includes much of the Atlantic and Pacific Oceans north of the Equator. The newly defined area covers approximately 18 million square miles, or 18 percent of the world's deep ocean; long-range plans call for coverage of an additional 12 percent. The Administration estimates that the geophysical surveys for the 18-percent area will be completed by the early 1980's and that the entire 30-percent area will be completed by 1988.

The Administration has one ship working part time on this program. It plans to increase this effort to three ships on a full-time basis by 1979.

NAVY GEOPHYSICAL SURVEYS

The U.S. Naval Oceanographic Office conducts deep-ocean surveys to meet the requirements of the Antisubmarine Warfare/Undersea Warfare forces and to support other Navy and Department of Defense missions. These surveys are designed to provide information pertinent to submarine and antisubmarine warfare, search and rescue, strike force,

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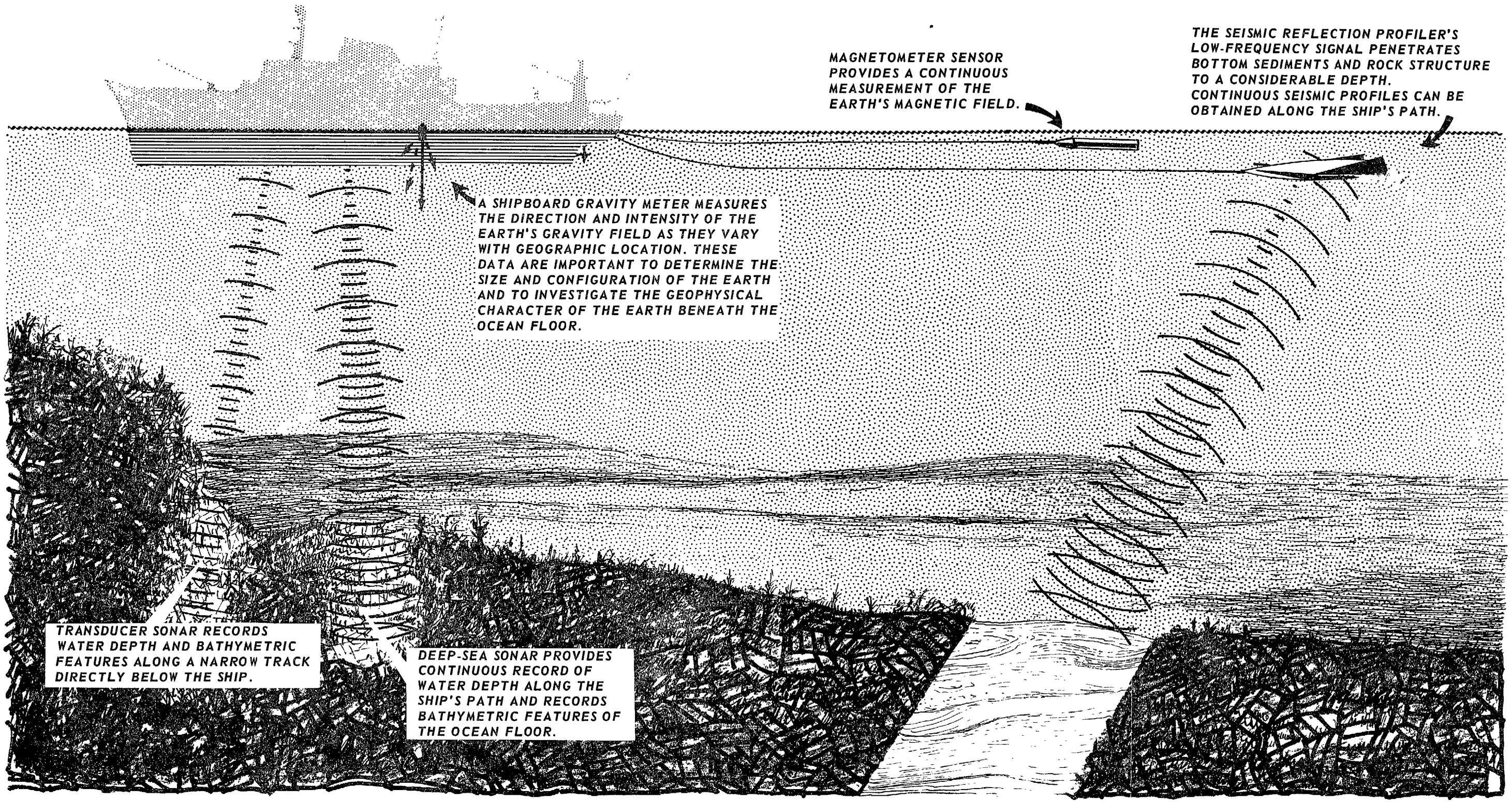
[1] Bathymetry measurements are a determination of water depth to depict sea floor topography; the magnetics and gravity measurements provide increased knowledge about the distribution of the earth's magnetic and gravity fields; and seismic profiles serve to identify the structure of the sea's subbottom.

ILLUSTRATION OF A SHIP CONDUCTING AN UNDERWAY GEOPHYSICAL SURVEY



NOTE: THE MEASUREMENTS SHOWN ARE EXAMPLES OF THE PRINCIPAL ONES OBTAINED DURING A GEOPHYSICAL SURVEY.

SOURCE: AN ADMINISTRATION PUBLICATION DESCRIBING THE CAPABILITIES OF THE SHIP "DISCOVERER".

sealift logistic support, and other operations. Also the data collected provide insight into the nature of the oceans by explaining scientific abnormalities and by providing preliminary assessment of economic potential. The military priorities of the mission operations being supported and the related time constraints govern the survey resources assigned and the geographic areas surveyed.

The Antisubmarine Warfare Survey was initiated in 1967 and is the Navy effort most related to the Administration's activities discussed in this report. Its purpose is to obtain information in strategic areas that is required for operational use of current and projected weapon systems. It was planned that all the Northern Hemisphere ocean areas, except the Arctic Ocean, would be surveyed under this project by the early 1980's; however, according to a Navy official, this target date had slipped because construction plans had been canceled for some ships planned for this project.

For convenience in planning surveys, in reporting data, and in establishing discrete work units, the Navy has blocked the areas into a series of task areas, each being assigned a priority for accomplishment. There are 40 task areas in the North Pacific and 34 in the North Atlantic, amounting to about 37 million square miles. Each task area is about 0.5 million square miles in size. As of December 1970 five task areas in the Far East and one task area in the Gulf of Mexico, totaling about 3 million square miles, had been completed.

Antisubmarine warfare surveys are subdivided into three separate phases: geophysical, oceanographic, and acoustic. Geophysical surveys are performed while the ship is under way and involve obtaining measurements of bathymetry, magnetics, gravity, and seismic profiles. These data are utilized to plan the execution of the other survey phases.

Oceanographic surveys, performed by a vessel on station, involve collecting deep-ocean water, core and dredge samples, bottom photographs, salinity, temperature, and sound-velocity data. Acoustic surveys, performed with one ship on station and a second ship under way, include measurements of reverberation and background noise as well as

signal strength and distortion. Of these three types of surveys, only the geophysical surveys are discussed in this report.

The Navy, to determine the data needed and coverage required, evaluates all the existing geophysical data available before initiating surveying operations in a task area. The tracklines run by the Navy are not run in a parallel gridline pattern but are conducted in whatever orientation serves to obtain data representative of the survey area in the most efficient manner. The coverage obtained in this type of survey is approximately equivalent to running tracklines 20 to 30 miles apart.

The Navy has had as many as four ships conducting geophysical surveys as part of its Antisubmarine Warfare Survey. The projected level, however, is for three ships, and all ships are time-shared between the geophysical surveys and high-priority operations.

CHAPTER 3

OPPORTUNITY TO REDUCE COST OF DEEP-OCEAN GEOPHYSICAL SURVEYS

Similar programs conducted by the individual Federal agencies need to be coordinated, to avoid unnecessary duplication of effort and unnecessary costs. We estimate that the Federal Government could, by the early 1980's, save about $20.1 million if the deep-ocean geophysical surveys to be conducted by the Administration and the Navy are effectively planned and coordinated. Although both agencies are aware of the other's geophysical surveying activities, they do not have any formal mechanism for coordinating these surveys.

The long-range plans of the Administration and the Navy provide for obtaining geophysical data in the same 16-million square-mile area of the unsurveyed area of the Atlantic and Pacific Oceans during the next two decades. (See illustrations on pp. 15 and 16.)

The Navy's geophysical surveying activities in this area could be eliminated in most cases if the Administration, which performs more extensive surveys, would provide the Navy with the data it requires.

ADMINISTRATION IS CAPABLE OF PERFORMING NAVY GEOPHYSICAL SURVEYS

According to an Administration official, the Navy's method of conducting its Antisubmarine Warfare Survey does not provide data that meet the Administration's program requirements because the Navy's survey coverage is neither dense enough nor performed in parallel grids. On the other hand Navy officials advised us that the Administration's method of conducting geophysical surveys provides data that could fulfill most requirements of the geophysical phase of the Navy's Antisubmarine Warfare Survey. Also we were informed that data obtained by the Administration are at closer intervals than the data obtained by the Navy.

Since the geophysical data obtained by the Administration would satisfy most Navy requirements, we examined into

the feasibility of the Administration's performing surveys and providing the data to the Navy. We reviewed the Administration's program requirements, the amount of time the Administration spends performing deep-ocean geophysical surveys, and its equipment needs. We reviewed also a special cooperative project between the Administration and the Navy, which was entered into subsequent to the beginning of our review, to determine whether the geophysical surveying activities of the two agencies could be similarly coordinated.

Administration's program requirements

Coordination of geophysical surveys with the Navy would not require a change in the method of surveying by the Administration or in the total ocean area coverage. It may require an alteration, however, in the Administration's planned order of completion of the areas within the geographic boundaries outlined in its program. There would be very little, if any, effect on the Administration's program if its planned order of completion were altered.

In a planning document dated September 1969, the Administration stated that benefits from deep-ocean surveying might not accrue for decades because the methods of economically extracting the resources from the deep ocean had not been devised. This plan concluded that it was essential that these surveys be done so that an orderly utilization of the deep-ocean resources could be made when the technology for extracting them is devised. Although the Administration considers it necessary to complete the surveys by 1988, there is no apparent order of priority which must be followed to achieve the Administration's overall objectives. We therefore believe that the Administration could alter its program to help satisfy the Navy's needs without affecting its own program requirements.

Ship time required for conducting geophysical surveys

The Navy normally spends a total of about 6 ship-months in each task area conducting geophysical surveys and generally does two task areas a year. Because its geophysical surveys are more extensive, the Administration would require approximately 9 ship-months to do a Navy task area.

The Administration has spent 41 ship-months on the Scientific Exploration and Mapping Program since its inception in 1961 through 1969. From 1961 through 1965 the Administration spent an average 7 ship-months a year on the program. From 1966 though 1969 it averaged less than 2 ship-months a year on the program due to a shortage of funds. The Administration's current plans, however, provide for 7 ship-months a year to be spent on its program and for future effort to be increased so that it can attain its goal of completing 30 percent of the world's oceans by 1988. The Administration's long-range plans propose a total of three ships for this program by 1979.

Equipment requirements

Navy officials stated that the geophysical data obtained from Administration surveys would satisfy Antisubmarine Warfare Survey requirements with the exception of seismic data. This data would have to be obtained by using different equipment; but, according to Navy officials, this could be accomplished easily by replacing one of the several existing transducers (used in obtaining bathymetric data) on the Administration's ships with the transducer needed to meet the Navy's requirements.

Navy officials said that, if coordination with the Administration could be worked out, the Navy probably would equip the Administration's ships with the transducers needed at an estimated cost of about $120,000 for each of the three ships planned for the Administration's program. Administration officials advised us that, if coordination is effected and if the Navy wants specific frequency seismic measurements, the necessary transducers could be installed on the Administration's ships without changing its method of performing the surveys.

Cooperative geophysical survey project

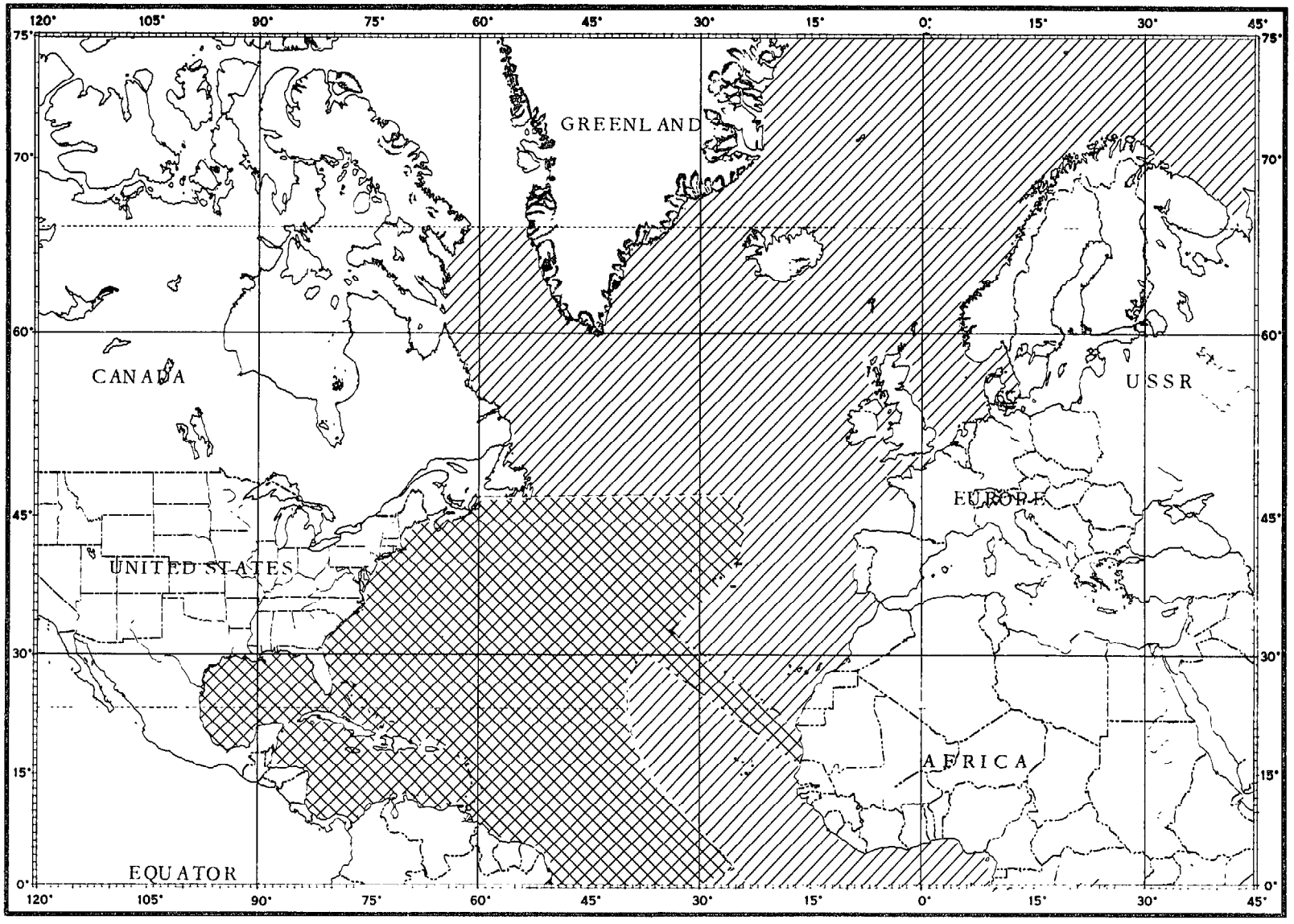
In December 1969 the Administration and the Navy entered into an agreement whereby the Administration would be reimbursed about $500,000 by the Navy for conducting limited geophysical surveys in the Atlantic and Pacific Oceans. The Navy was to provide the Administration with equipment and the personnel needed to operate the equipment.

We were informed by Navy officials that these surveys were intended to provide information in support of the Navy's POLARIS missile program and an Air Force missile-testing program. The results of these surveys, which were estimated to take 7-1/2 ship-months to complete, were to be made available to both agencies upon completion of field operations.

We were advised by Navy officials that the Navy had entered into this cooperative project to fulfill urgent program requirements. They stated that the Navy ship planned for use was not available because it was scheduled for overhaul. They stated that, rather than delay the survey, the Navy laid up this ship for about one half of fiscal year 1969 and thereby generated funds for reimbursing the Administration. This enabled the Navy to obtain needed surveys in the time required and the Administration to extend its ship operating period which it previously had shortened because of a fund shortage.

Both agencies considered this project successful and beneficial. We believe that this project demonstrates that the Administration is capable of performing surveys for the Navy and that similar coordination could be accomplished in future geophysical survey programs of the two agencies.

ADMINISTRATION AND NAVY GEOPHYSICAL SURVEY AREAS IN THE NORTH ATLANTIC OCEAN



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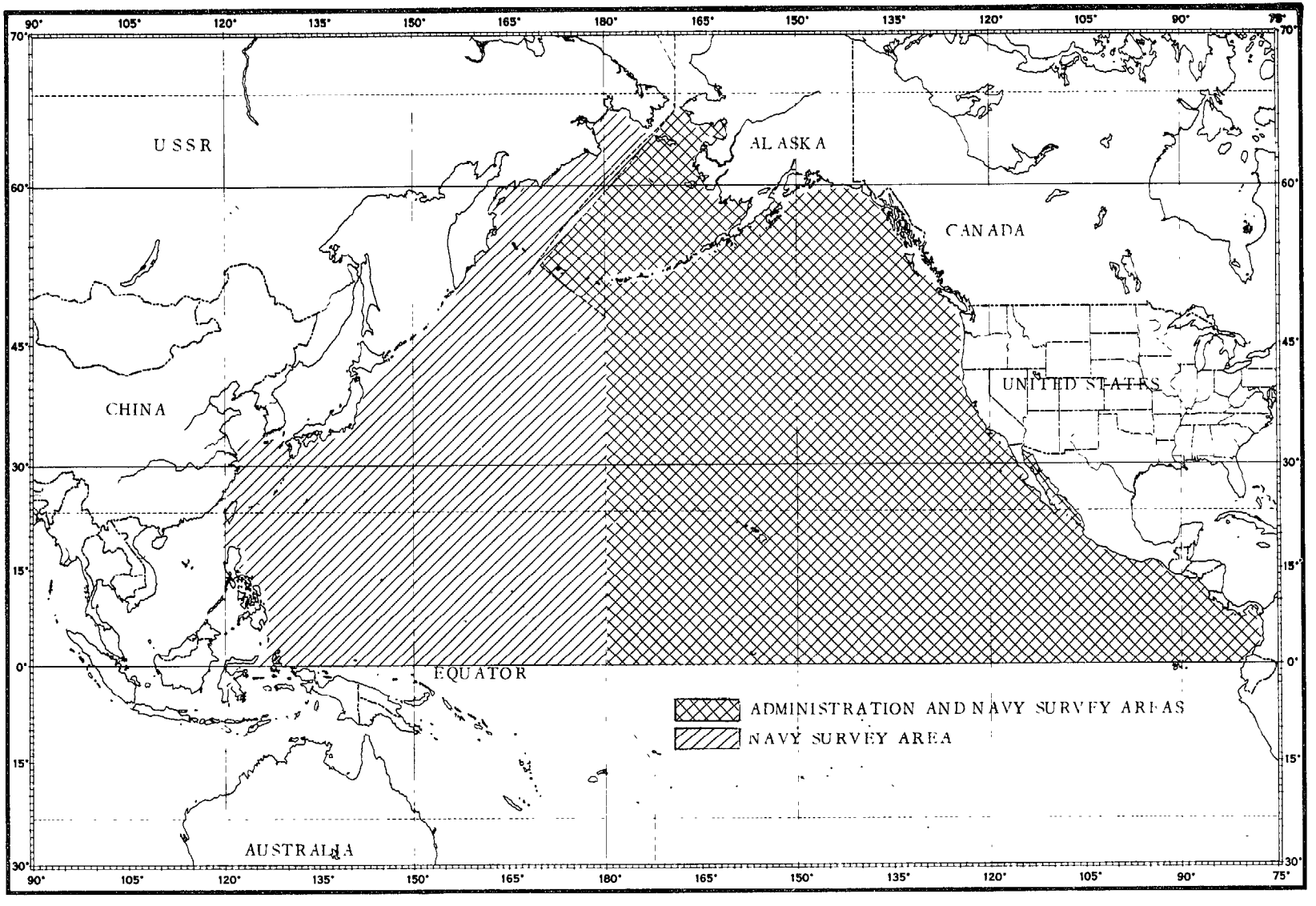

CHAPTER 4

SAVINGS ACHIEVABLE THROUGH COORDINATION

Although both the Administration and the Navy are aware of each other's surveying activities and of the types of measurements to be obtained, each agency is planning to collect similar geophysical data on the same 16-million square-mile ocean area. On the basis of Administration- and Navy-estimated surveying costs, we estimate that, if both agencies proceeded independently, it would cost the Navy about $20.5 million and the Administration about $46.9 million, or a total cost to the Government of about $67.4 million, to survey this area.

We estimate that, if these agencies would effectively coordinate their geophysical surveys, the Federal Government could save a total of about $20.1 million by the early 1980's. This represents the amount that would be spent on geophysical surveys by the Navy, less the cost of the necessary equipment ($360,000) that would be installed on the Administration's three ships.

We discussed with Navy officials the extent that their survey effort could be reduced if the Administration performed its surveys in Navy areas of interest before the Navy performed its surveys. Navy officials advised us that, if the Administration obtained the survey data, the Navy could completely eliminate geophysical surveying in those task areas surveyed by the Administration. Consequently the Government's cost for planned geophysical surveying could be reduced by about $20.1 million, and, according to Navy officials, the availability of data for national security could be expedited because Navy ships could be used to conduct other phases of the Navy program or to do geophysical surveying outside of Administration assigned areas. They advised us that, depending on the data received from the Administration, it may be necessary to obtain additional data in some areas. They informed us, however, that, if necessary, this probably could be done during the second or oceanographic phase of their project at no or very little additional cost.

Discussions with Administration officials indicated that the additional cost to the Administration of gathering geophysical survey data to meet Navy needs would be insignificant. Furthermore Administration officials stated that the Navy requirements could be met quite readily while meeting their own requirements. An example of how savings can be effected is described below.

As of September 1969 the Gulf of Mexico was the only area in the Administration's area of interest in which the Navy had conducted antisubmarine warfare geophysical surveys. The Navy surveyed this area during 1968 and 1969 at an estimated cost of $1.1 million, and its ships ran about 28,000 lineal miles of tracklines in covering the 450,000 square-mile area.

Since the Navy's antisubmarine warfare geophysical surveys do not provide sufficient information to satisfy the Administration's program requirements, the Administration ordinarily would have to resurvey the area. The Administration would be required, however, to run fewer lineal miles of tracklines than in a previously unsurveyed area. On the basis of its ship operating costs and survey specifications, we estimate that the Administration would have to run about 40,000 lineal miles of tracklines to cover this area, at a cost of about $1.2 million. The cost to the Government for obtaining geophysical data in the Gulf of Mexico, therefore, would be about $2.3 million--$1.2 million by the Administration and $1.1 million by the Navy.

If the Administration and the Navy had coordinated their programs and if the Administration had performed a slightly expanded geophysical survey in the Gulf of Mexico of about 45,000 lineal miles, the total cost to the Government would have been $1.3 million rather than $2.3 million since the Navy could have used the data obtained by the Administration and thereby eliminated its own geophysical surveys and reduced Government costs about $1 million.

In addition to conducting the antisubmarine warfare survey, the Navy conducted a special geophysical survey in the Gulf of Mexico beginning in 1968 in support of an Air Force missile-testing program. Navy officials advised us that this special project was not a continuing Navy program

and that there were no other Navy special projects that would provide geophysical data for the same area being covered by the Administration's geophysical surveys. Although the primary purpose of this Navy project was to obtain gravity information at 3- to 6-mile line spacing, bathymetric and magnetic data were also obtained. In December 1969 the Navy agreed to provide the Administration with the data obtained. An Administration official advised us that the data had been received from the Navy but had to be analyzed to determine whether it would meet the Administration's program requirements.

CHAPTER 5

REASONS COORDINATION HAS NOT BEEN ACCOMPLISHED

Although the Administration and the Navy were aware of each other's surveying activities, they had not established detailed specifications to ensure that the data obtained by the Administration satisfy both agencies' program requirements. The Office of Management and Budget is responsible for coordinating survey programs but has not provided guidance to coordinate the geophysical survey programs of the Administration and the Navy.

From discussions with Administration and Navy officials, we found that there was general agreement that the two programs could be coordinated. We were advised, however, that action had not been taken nor had formal meetings been held to implement such coordination because both programs were relatively new. Officials from both agencies agreed that coordination of the programs should be considered when preparing their long-range plans.

Office of Management and Budget officials advised us that, because of the relatively small magnitude (dollarwise) of the geophysical survey programs of the Administration and the Navy, no effort had been made to review them. They stated that the Office of Management and Budget had established a priority system for reviewing Government programs but that, due to the limited size of its staff, it did not review all small programs unless outside interest was shown.

In July 1970 Navy officials said that informal communication did take place with the Administration but agreed with us that a formal mechanism for coordination should be established. Also the officials said that the Navy had received data from the Administration's geophysical surveys in the North Pacific Ocean but that the Administration's ships, because of equipment failures, had not obtained all the measurements called for in the project instructions. Consequently the data received from the Administration did not completely satisfy Navy Antisubmarine Warfare Survey requirements.

In July 1970 Administration officials advised us that coordination did exist and cited as an example the "Oceanographic Ship Operating Schedules" compiled and published by the National Council on Marine Resources and Engineering Development (Marine Sciences Council). They said that these schedules showed where planned surveys were to be conducted by the different Federal agencies and the types of measurements that would be gathered.

Also we were advised that in November 1969 the Vice President of the United States, as Chairman of the Marine Sciences Council, assigned the Administration the lead agency responsibility for marine mapping, charting, geodesy, and data storage. To assist in meeting this responsibility, the Administration established the post of Federal Coordinator for Ocean Mapping and Prediction.

The post was assumed on an additional-duty basis by the Oceanographer of the Navy in July 1971. In this role the Oceanographer reports to the Administrator and is responsible for ensuring that the efforts of all Federal agencies engaged in marine mapping, charting, geodesy, and marine environmental prediction are properly coordinated and that Federal Government-wide plans are prepared for achieving national objectives in these marine activities.

The Administration has proposed the establishment of an interagency committee for mapping and charting the oceans. We were advised that, as of September 1971, the committee had not been established pending completion of a study on ocean survey requirements.

Also Administration officials said that informal coordination existed with the Navy. This coordination consisted of the Administration's informing the Navy where its initial deep-ocean surveys were to be conducted. The officials agreed that a formal mechanism should be established to ensure better coordination.

In October 1970 an Administration official, in response to a Navy inquiry, provided the Oceanographer of the Navy with the Administration's deep-ocean survey plans for calendar year 1971. During November 1970 officials from the Administration and the Navy held a meeting to review means

by which these deep-ocean surveys could be carried out with maximum mutual benefit and minimum duplication of survey effort.

Since November 1970 a series of discussions have been held and correspondence has been exchanged between the Administration and the Navy. Officials from these agencies have determined that the most efficient means of achieving coordination would be for the Oceanographer of the Navy to establish a liaison group within the Administration to provide interface between the technical programs of common interest to both agencies. In addition, the Administration would assign to the Navy technical-level liaison representatives to facilitate the exchange of technical data.

CHAPTER 6

AGENCY COMMENTS, GAO CONCLUSIONS, AND RECOMMENDATIONS

AGENCY COMMENTS

We brought our findings to the attention of the Department of Commerce and the Department of Defense in a draft of this report on March 5, 1971. We proposed that the Secretary of Commerce and the Secretary of the Navy jointly plan and schedule their geophysical surveys so that the data obtained by the Administration would satisfy both agencies' program requirements. We proposed also that the Administration and the Navy explore the possibility of coordinating other marine science activities, such as oceanographic surveys.

In commenting on our draft report, the Administration stated that unwarranted and costly duplication of effort could and should be avoided in geophysical surveying activities which require significant expenditures of public funds. (See app. I.) The Administration stated also that there was a need to ensure the coordination of the planning of surveys and that it had exchanged correspondence with the Navy regarding the establishment of liaison offices and staffs to coordinate geophysical surveys, uniform specifications, and related requirements.

The Navy, in commenting on our draft report, stated that it considered the report to be, in general, factually correct. It concurred in the conclusions in the report and strongly endorsed the proposals concerning the effective coordination of Navy and Administration programs. (See app. II.)

The Navy stated that, because the Administration had several oceanographic programs, there was a demand that a more intensive, bilateral coordination arrangement be effected between the Administration and the Navy. Also the Navy said that the determination of the most efficient means of achieving this coordination had been the subject of

discussion and correspondence between the Navy and the Administration from October 1970.

We were advised that an agreement in principle had been reached on the exchange of personnel, which would ensure maximum effective coordination of the planning and scheduling of geophysical surveys. Also, according to the Navy, this agreement will facilitate the examination of the overall marine science activity of both agencies for selection of other areas which warrant similar coordination and serve as the means for such coordination.

GAO CONCLUSIONS

We believe that the Administration and Navy agreement to exchange personnel to coordinate the planning and execution of their deep-ocean geophysical surveys is an important first step toward eliminating duplication of geophysical surveys and improving the effectiveness of Government efforts in this area.

As of September 1971 the administrative procedures and survey specifications--required to ensure that the Navy's high-priority areas are surveyed by the Administration first and that the measurements obtained will satisfy both agencies' program requirements--were being developed. In our opinion these must be established, evaluated, and jointly agreed upon before effective coordination can be accomplished.

In addition, after the Administration identifies the remaining 12-percent area to be covered in its program, the geophysical surveys of this area should be coordinated with the Navy's Antisubmarine Warfare Survey. Also we believe that possibilities exist for coordinating other marine science activities of both agencies.

RECOMMENDATIONS TO THE SECRETARIES OF COMMERCE AND THE NAVY

In view of the opportunity for increasing the effectiveness of the Government's deep-ocean geophysical surveying activities and in view of the potential for significant

savings, we recommend that the Secretary of Commerce and the Secretary of the Navy

--ensure that the plans being formulated by representatives of their departments result in the establishment of administrative procedures and survey specifications that will provide effective coordination of the deep-ocean geophysical survey programs and

--explore the possibility of coordinating other marine science activities, such as oceanographic surveys.

CHAPTER 7

SCOPE OF REVIEW

We examined into the feasibility of coordinating geophysical surveys conducted by the Administration and the Navy and estimated the effect that such coordination would have on both agencies' programs. Our review was conducted at the headquarters of the Administration located in Rockville, Maryland, at the Office of the Oceanographer of the Navy in Alexandria, Virginia, and at the U.S. Naval Oceanographic Office, Suitland, Maryland.

At these locations we examined records pertaining to (1) the extent of geophysical surveying activities and (2) the practices and procedures followed by these agencies pertaining to geophysical surveying. We also reviewed applicable legislation, regulations, and agency instructions providing for the coordination of surveying activities among the Federal agencies. In addition, we discussed with agency officials matters pertinent to our review.

We also visited the Office of Management and Budget and examined into its responsibilities for coordinating the Federal Government's surveying activities.

THE ASSISTANT SECRETARY OF COMMERCE
Washington, D.C. 20230

APR 9 1971

Mr. Max A. Neuwirth
Associate Director
Civil Division
General Accounting Office
Washington, D. C. 20548

Dear Mr. Neuwirth:

This is in reply to Mr. Eschwege's letter of March 3, 1971, requesting comments on a proposed report to the Congress on the "Opportunity To Reduce The Cost of Deep-Ocean Geophysical Surveys, Department of Commerce, Department of The Navy."

We have reviewed the comments of the National Oceanic and Atmospheric Administration and believe that they are appropriately responsive to the matters discussed in the report.

Sincerely yours,

Larry A. Jobe

Enclosures

APPENDIX I

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Rockville, Md. 20852

MAR 2 9 1971

Mr. Henry Eschwege
Associate Director
Civil Division
General Accounting Office
Washington, D. C. 20548

Dear Mr. Eschwege:

Attached are comments from the National Oceanic and Atmospheric Administration on the draft of a proposed report to the Congress on "Opportunity to Reduce the Cost of Deep-Ocean Geophysical Surveys".

Sincerely,

John W. Townsend

John W. Townsend, Jr.
Associate Administrator

Attachment

COMMENTS FROM THE NATIONAL OCEANIC AND ATMSOPHERIC ADMINISTRATION

DRAFT OF REPORT TO THE CONGRESS OF THE UNITED STATES, OPPORTUNITY TO REDUCE THE COST OF DEEP-OCEAN GEOPHYSICAL SURVEYS, DEPARTMENT OF COMMERCE - DEPARTMENT OF THE NAVY.

The National Oceanic and Atmospheric Administration concurs with the intent of the recommendations and suggestions of the report - that unwarranted and costly duplication of effort can and should be avoided in geophysical survey activities requiring significant expenditure of public funds; and furthermore, though not stressed in the report, we consider such coordination necessary to promote effective utilization of limited national resources, which the survey vessels, equipment and personnel of the Administration and the Navy represent.

As the report has properly noted, there is a need to insure the coordination of the planning of surveys. The Marine Council, which has been the formal means for such coordination, will cease operation by the end of June 1971. The role of that agency in marine mapping, charting, geodesy and data storage was assigned to the Department of Commerce by the Vice President on November 7, 1969. In response to this charge, we have proposed the establishment of an Interagency Committee for Mapping and Charting the Oceans. As part of an implementation plan to carry out the lead agency role, this proposal has been submitted to the agencies involved and we are now awaiting final response. In addition, we have exchanged correspondence with the Navy regarding the establishment of liaison officers and staffs to coordinate geophysical surveys, uniform specifications and related requirements. Through these levels of coordination we believe that effective Administration programs can and will be carried out.

In amplification of the report we wish to note that our SEAMAP program since its inception in 1961 has attempted to meet multiple national needs through the advancement of our knowledge of the sea floor and the provision of geophysical and bathymetric data. Therefore, in planning these systematic surveys, we incorporate known requirements and priorities. Since the early 1960's we and the Navy have coordinated our related survey efforts in this context. Initially, coordination of SEAMAP with survey activities of other agencies, including the Navy, was achieved through the Ocean Survey Panel of the Interagency Committee for Oceanography. Through the years SEAMAP has been coordinated and planning information exchanged through existing inter-agency mechanisms, the most recent being the National Council on Marine Resources and Engineering Development (Marine Council). These actions, together with informal coordination, have ensured that surveys have not been conducted

in the same area by both organizations and data have been freely interchanged. For example, our activities in the North Pacific significantly reduced the need for Navy surveys in this region and existing Navy data in the Atlantic and Pacific are available and will reduce the number of track miles we plan to run to satisfy our program requirements.

Our program was on the wane in the late sixties because of its relative priority in a period of restricted resources. Therefore, it could not respond to the Navy's priorities as to timeliness and areas of coverage required. The need for coordination during this period was minimal. Within the last two years we have reactivated our systematic geophysical survey programs and initiated discussions with the Navy as regards a means for coordinating the respective programs. As indicated in the GAO report, such discussions have led to a number of surveys conducted by us and funded by both organizations to satisfy the needs of each.

/See GAO note./

The number of these cooperative activities is expected to increase as our program develops, resulting in better utilization of resources by both agencies and reduction in cost to the government.

GAO note: Deleted comments relate to matters discussed in the draft report but have not been discussed in the final report.

DEPARTMENT OF THE NAVY
OFFICE OF THE SECRETARY
WASHINGTON, D. C. 20350

11 MAY 1971

Mr. Charles M. Bailey
Director, Defense Division
U. S. General Accounting Office
Washington, D. C. 20548

Dear Mr. Bailey:

The Secretary of Defense has asked me to reply to your letter of 5 March 1971 which forwarded the GAO draft report on opportunity to reduce the cost of deep-ocean geophysical surveys.

I am enclosing the Navy reply to the report.

Sincerely yours,

ROBERT A. [illegible]
Assistant Secretary of the Navy

Encl:
(1) Navy Reply to GAO Draft Report of 5 Mar 1971 on Opportunity to Reduce the Cost of Deep-Ocean Geophysical Surveys, Department of Commerce, Department of the Navy (OSD Case #3247)

APPENDIX II

Navy Reply

to

GAO Draft Report of 5 March 1971

on

Opportunity to Reduce the Cost of Deep-Ocean Geophysical Surveys Department of Commerce, Department of the Navy

(OSD Case #3247)

I. Summary of GAO Findings, Conclusions and Recommendations

GAO has reviewed the major deep ocean geophysical survey program, SEAMAP, of the National Oceanic and Atmospheric Administration (NOAA), Department of Commerce, and a major geophysical survey effort being carried out by Navy primarily in support of antisubmarine warfare. The review was made because the data collected in the two programs are similar and geographic coverage requirements of the two agencies overlap in part. The Navy geophysical efforts involved consist of the first survey phase of its Antisubmarine Warfare/Undersea Warfare Survey project, carried out primarily to obtain data on the probable boundaries of areas of similar bottom reflectivity as a guide to follow-on acoustic and oceanographic surveys. Of primary interest are deep and shallow structure seismic measurements, magnetic data, and bathymetry.

GAO inquired into the survey programs to determine whether it were feasible for NOAA and Navy to coordinate their efforts and thereby reduce costs to the Government.

A. Findings: The GAO found that:

1. The Navy plans to survey a 37-million square-mile area of the North Atlantic and North Pacific, 16 million square miles of which is common to NOAA survey requirements.

2. NOAA surveys, to meet the agency's requirements for data, are more intensive than Navy's and although all the different types of data Navy requires are not now being collected by NOAA, additional equipment could be installed in NOAA ships @ $120,000/ship to allow NOAA surveys to meet all Navy requirements for geophysical data in specific geographic areas if survey specifications were proper and adhered to, and surveys were timely.

3. The data being collected by NOAA is intended for resource exploitation

Enclosure (1)

from the deep oceans, a capability not yet existing. Therefore, survey area priorities could be adjusted without adverse impact on the overall program objectives.

4. Navy and NOAA could coordinate their surveys through joint planning and specification development

B. Conclusions: The GAO concluded that:

1. Effective coordination of the two agencies' geophysical survey programs would avoid duplication of effort, and reduce the cost to the government substantially below that which independent surveys would entail.

2. Possibilities exist for coordinating other marine science activities.

C. Recommendations: GAO recommends that:

1. The Secretary of the Navy and the Secretary of Commerce jointly plan and schedule their geophysical surveys so that the data obtained by NOAA satisfies both agencies requirements.

2. Navy and NOAA explore the possibility of coordinating other marine science activities.

[See GAO note, p. 34.]

II. Statement of the Department of the Navy Position:

The Navy considers the report to be, in general, factually accurate; concurs in the conclusions of the report; and strongly endorses the recommendations concerning the effective coordination of Navy and NOAA programs. Comments concerning specific GAO statements are contained in TAB A.

Recommendations 1 and 2 are consistent with Navy policy to exploit to the utmost the programs of other agencies and the private sector, as well as foreign sources, to satisfy needs for oceanographic data. There has been continuing, though informal, coordination between the operating activities of the two agencies (the old Coast and Geodetic Survey of ESSA -- now the National Ocean Survey of NOAA -- and the Navy's Naval Oceanographic Office) through the years which has served well to prevent duplication. On a formal basis the Interagency Committee on Oceanography under FCST, through its very active committees, served as focal point for coordination of all federal oceanographic efforts until it was replaced in 1966 by the National Council on Marine Resources and Engineering Development (NCMRED). Since that time, a formal high level review of federal marine science programs has taken place annually under the NCMRED. This government-wide review served to familiarize representatives of all gencies with the major federally sponsored marine

science projects, but was not designed nor did it function as a mechanism to effect the coordination of the type being recommended by the GAO. The Federal Council for Science and Technology is currently establishing an inter-agency group with representation at the Assistant Secretary level to replace the NCMRED.

The GAO notes that in the past no duplication of effort has occurred, and recognizes that informal coordination and liaison have taken place, but properly points out that in view of the fact that the magnitude of the SEAMAP effort of NOAA is planned to increase from its level of less than two ship months annually in recent years to a three ship level by 1979, a formal means of coordination should be implemented.

The concentration of several civil oceanographic programs in NOAA, and the major program initiatives being considered by that organization, also demand that a more intensive, bilateral coordination arrangement be effected between NOAA and the Navy for the future. Determination of the most efficient means of achieving this coordination has been the subject of Navy/Commerce discussion and correspondence since shortly after NOAA was established by Executive Reorganization Plan No. 4 in October 1970. Agreement in principle has been reached on the exchange of agency personnel, with one major specific objective the close coordination of survey planning, maximum exploitation of survey capability, and fullest feasible exchange of survey data. The exchange of technical personnel, who on the Navy side will be representatives of the Oceanographer of the Navy, will insure maximum effective coordination of the planning and scheduling of geophysical surveys. It will also facilitate the examination of the overall marine science activity of both agencies for selection of other areas which warrant similar coordination, and serve as the means to effect such coordination. It should be noted that the Defense Intelligence Agency is the single management authority for the overall DOD mapping, charting and geodetic program and has as one of its functions the establishment of the DOD position when dealing with the Department of Commerce or other concerned Federal agencies. As noted above, negotiations are now underway which will establish a Navy liaison group at NOAA and it is expected that this group will also represent DIA to insure coordination of DOD and NOS related activities in ocean geophysical programs.

Recommendation 3 should pose no problem, and Office of Management and Budget attention is invited through whatever mechanism they deem appropriate to this special area of GAO interest.

[See GAO note.]

GAO note: Deleted comments relate to matters discussed in the draft report but have not been discussed in this final report.

PRINCIPAL OFFICIALS OF THE DEPARTMENT OF COMMERCE AND THE DEPARTMENT OF THE NAVY RESPONSIBLE FOR THE ADMINISTRATION OF ACTIVITIES DISCUSSED IN THIS REPORT

	Tenure of office	
	From	To
DEPARTMENT OF COMMERCE		
SECRETARY OF COMMERCE:		
Maurice H. Stans	Jan. 1969	Present
Cyrus R. Smith	Mar. 1968	Jan. 1969
Alexander B. Trowbridge	June 1967	Mar. 1968
Alexander B. Trowbridge (acting)	Feb. 1967	June 1967
John T. Connor	Jan. 1965	Jan. 1967
UNDER SECRETARY OF COMMERCE:		
James T. Lynn	Apr. 1971	Present
Rocco C. Siciliano	Feb. 1969	Apr. 1971
Joseph W. Bartlett	Aug. 1968	Jan. 1969
Howard J. Samuels	Nov. 1967	July 1968
J. Herbert Hollomon (acting)	Feb. 1967	Oct. 1967
Leroy Collins	July 1965	Oct. 1966
ASSISTANT SECRETARY FOR SCIENCE AND TECHNOLOGY (note a):		
James H. Wakelin, Jr.	Feb. 1971	Present
Richard O. Simpson (acting)	Dec. 1970	Feb. 1971
Myron Tribus	Mar. 1969	Nov. 1970
Allen V. Astin (acting)	Feb. 1969	Mar. 1969
John F. Kincaid	Sept. 1967	Feb. 1969

	Tenure of office	
	From	To
DEPARTMENT OF COMMERCE (continued)		
ASSISTANT SECRETARY FOR SCIENCE AND TECHNOLOGY (note a) (continued):		
Allen V. Astin (acting)	July 1967	Sept. 1967
J. Herbert Hollomon	May 1962	July 1967
ADMINISTRATOR, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (note b):		
Robert M. White	Feb. 1971	Present
Robert M. White (acting)	Oct. 1970	Feb. 1971
Robert M. White	July 1965	Oct. 1970
DEPUTY ADMINISTRATOR, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (note b):		
Howard W. Pollock	Feb. 1971	Present
Robert M. White (acting)	Oct. 1970	Feb. 1971
John W. Townsend, Jr.	July 1968	Oct. 1970
Werner A. Baum	Jan. 1967	July 1968
Rear Adm. H. Arnold Karo	July 1965	Dec. 1966
DIRECTOR, NATIONAL OCEAN SURVEY (note c):		
Rear Adm. Don A. Jones	Feb. 1971	Present
Rear Adm. Don A. Jones (acting)	Oct. 1970	Feb. 1971
Rear Adm. Don A. Jones	Sept. 1968	Oct. 1970
Rear Adm. James C. Tison, Jr.	July 1965	Sept. 1968
DEPARTMENT OF THE NAVY		
SECRETARY OF THE NAVY:		
John H. Chafee	Jan. 1969	Present
Paul R. Ignatius	Sept. 1967	Jan. 1969
Charles F. Baird (acting)	Aug. 1967	Sept. 1967
Robert H. B. Baldwin (acting)	July 1967	Aug. 1967
Paul H. Nitze	Nov. 1963	June 1967

	Tenure of office	
	From	To
DEPARTMENT OF THE NAVY (continued)		
CHIEF OF NAVAL OPERATIONS:		
Adm. Elmo R. Zumwalt, Jr.	July 1970	Present
Adm. Thomas H. Moorer	Aug. 1967	June 1970
Adm. David L. McDonald	Aug. 1963	July 1967
OCEANOGRAPHER OF THE NAVY (note d):		
Rear Adm. W. W. Behrens, Jr.	Oct. 1970	Present
Rear Adm. Odale D. Waters, Jr.	Aug. 1966	Oct. 1970

[a]The Assistant Secretary was responsible for the administration of activities of the former Environmental Science Services Administration.

[b]The Agency was established effective October 1970 pursuant to Reorganization Plan No. 4. The reorganization consolidated the Environmental Science Services Administration with elements and programs of other Federal organizations that have marine science responsibilities.

[c]The organization was established as part of the National Oceanic and Atmospheric Administration effective October 1970. It was formerly the Coast and Geodetic Survey and the U.S. Lake Survey.

[d]The office of the Oceanographer of the Navy was established in August 1966 by Secretary of the Navy Instruction 5450.79.