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A Report to:

The President and The Congress

by the

National Advisory Committee on Oceans and Atmosphere

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Annual Report June 29, 1973

National Advisory Comm.

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A Report to:

The President and The Congress

by the

National Advisory Committee on Oceans and Atmosphere

Second Annual Report

Washington, D.C.

June 29, 1973

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NATIONAL ADVISORY COMMITTEE
ON
OCEANS AND ATMOSPHERE
Washington, D.C. 20230

To the President and the Congress:

Sirs:

I have the honor to submit to you the second Annual Report of the National Advisory Committee on Oceans and Atmosphere.

The Committee was established by P.L. 92-125, approved on August 16, 1971, and was directed to submit a comprehensive annual report to the President and to the Congress setting forth an overall assessment of the status of the Nation's marine and atmospheric activities.

This report is submitted to the Secretary of Commerce for transmittal as provided by the statute.

Respectfully,

William A. Nierenberg

William A. Nierenberg
Chairman

June 29, 1973

FOREWORD

In this, its second Annual Report, the National Advisory Committee on Oceans and Atmosphere (NACOA) comments on a number of fast-moving if somewhat disputatious topics: resource management organization, energy, the coastal zone, atmospheric affairs, and fisheries.

NACOA was chartered by P.L. 92-125 to report, both to the President and to the Congress, on national marine and atmospheric affairs, and to the Secretary of Commerce with respect to the National Oceanic and Atmospheric Administration (NOAA). It reports this year, as it did last, by treating a series of priority topics where it can do so with assurance. The intent is to deal with the leading edges of marine and atmospheric affairs rather than to review the whole array of programs. And, once again, there were several fundamental and pressing issues which NACOA wanted to include but did not, largely because preparation could not be adequate.

The theme of this report—which we treat in more detail in the Introduction—is the need for improved management of programs in both the oceans and the atmosphere to counter the dispersive tendencies which seem to be occurring in the shadow of jurisdictional frictions and in the absence of resource leadership. While NACOA be-

lieves there is no single way to accomplish this, it does offer suggestions and recommendations, both general and specific, by which improvements could take place.

SUMMARY OF RECOMMENDATIONS

NACOA FINDS the impact of budget cutbacks on oceanic and atmospheric programs distorts national priorities in these areas largely because of organizational fragmentation and the lack of a strong management focus at a sufficiently high level in government. NACOA therefore RECOMMENDS that:

> **To obtain the best use of our oceanic and atmospheric resources, responsibility for their management should be given a central focus, and their management, along with that for other natural resources, should be reorganized into a single Federal agency at the departmental level.**

NACOA FINDS that in balancing environmental costs against need for energy, the oceans must play an increasingly significant role during the difficult transition from national reliance on domestic terrestrial fuel to substantial use of energy from offshore oil and gas, from foreign oil and gas, and from nonconventional sources. NACOA therefore RECOMMENDS that:

> **Intensified exploration and drilling effort be undertaken offshore; that single-purpose single-point mooring deep-water oil terminals for landing foreign oil imports are generally preferable to multiple-use superports; and that such terminals should be operational in the Gulf by 1976 and off the East Coast by 1978. NACOA further RECOMMENDS that the offshore and coastal development for powerplant siting be seriously considered where the extraordinary capacity of the ocean for waste-heat absorption can be safely used.**

NACOA FINDS that the penalty for delay in funding the Coastal Zone Management Legislation enacted last fall has been lack of action in some states and uncoordinated action in others. NACOA therefore RECOMMENDS that:

> **The National Coastal Zone Management Act of 1972 (P.L. 92-583) be funded to the full amount authorized by law and its implementation in all aspects vigorously pursued.**

NACOA FINDS that it is now time to take advantage of the successes

in understanding large-scale atmospheric behaviour and to emphasize applying this knowledge, together with small-scale information, to deliver better forecasts and warnings. NACOA therefore RECOMMENDS that:

> **Increased priority be placed on smaller-scale meteorological phenomena, on disseminating routine local forecasts, and on monitoring public response to weather forecasts and warnings.**

NACOA FINDS that, although we appear to stand on the threshold of practical weather modification, and some facets are operational, in other applications a great deal of complex research still needs to be done. Unless the scientific manpower and funding are better directed, we assuredly will continue to make very slow progress towards weather control. NACOA therefore reiterates its RECOMMENDATIONS of last year that:

> **The many small programs in weather modification now scattered widely through the Federal agencies be focused and coordinated under NOAA's lead; basic cloud physics and dynamics be given higher priority; and that the legal, social, and economic impact of weather modification be thoroughly examined and appropriate regulatory and licensing legislation be sought.**

NACOA FINDS to its distress that national objectives for U.S. domestic and international fisheries are in disarray. NACOA therefore RECOMMENDS:

> **Passage of High Seas Fisheries Bills such as HR 4760 and S 1069; development of a national plan for use of the national fishery resources by the Secretaries of Commerce and Interior; that international agreements incorporate effective mechanisms for conservation and greater awareness of the problem of uniform international enforcement; and continued support of the species approach in the coming Law of the Sea Conference.**

NACOA OBSERVES that the Federal Budget crisis is less severe than it appeared to be in January. NACOA therefore strongly URGES that:

> **The President direct a reconsideration of high priority needs in ocean and atmospheric affairs as part of the 1975 budget review and restoration of selected reductions and postponements.**

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Introduction

Fragmentation *vs.* focus, fire-fighting *vs.* planning—these were the issues which this year turned NACOA inward and away from the international aspects of oceanic and atmospheric affairs it dealt with in last year's Annual Report. The theme which runs through most sections of this Report is about organization for the management of marine and atmospheric affairs and what the lack of such organization does in certain critical areas.

The impact of the budget cutbacks and restraints on oceanic and atmospheric programs has been subtle rather than abrupt, but it has had a distorting effect on programs and has resulted, in some instances, in a reduction of services which NACOA feels are important to the national interest. Momentum is being lost. We face the future with less assurance than we did last year at this time. NACOA notes, in not one place but in several, a dispersal of management and a withdrawal of support from important long-range centralized endeavours which could result in trouble down the road.

NACOA feels that this fragmentation, and this withdrawal of support from some long-range programs and their facilities, may have occurred because a natural sponsorship for resource management—the oceans and the atmosphere *are* resources—does not exist. The old backing is weakening, for oceanic affairs especially, as missions and problems change and budgets go flat or down. Nothing is taking its place even though the national need in ocean affairs grows larger.

For this reason NACOA deals with organizing, in the development and conservation of natural resources, for the better management of the Nation's oceanic and atmospheric endeavours. The generalities and suggestions for a functional arrangement are made in the first chapter. Some specific cases and arguments are in succeeding chapters:

- Lack of sponsorship may slow or warp the rational development of offshore energy resources with its delicate balance between essential

and necessary exploitation and the critical requirement of environmental protection. (See Chapter on Energy and the Oceans.)

- Complications in sponsorship resulted in lack of action in funding the Coastal Zone Management Act. A section of the Report examines what NACOA finds to be the high price of delay. (See Chapter on Managing the Coastal Zone.)
- Divided sponsorship has had a deleterious effect in some important atmospheric matters. There has been little progress toward the institution of controls of weather modification and investigation of its indirect societal effects. The experimentation in weather modification has itself had its leadership fragmented rather than consolidated. (See Chapter on Atmospheric Activities.)
- Disappearing sponsorship for the vessels, instrumentation, central facilities, and networks which brought physical oceanography to its present healthy state and marine geology and geophysics to a new epoch in exploring earth movement and change, means that the national preeminence in these areas will fade unless the trend is reversed. (We will enlarge on this point briefly below.)

We prepared, and will issue shortly, fairly lengthy discussions on marine geology and geophysics, and on physical oceanography. In both of these fields strong research programs are underway but there is reason to question whether this situation will last. In geophysics the status of the World Wide Standard Seismograph Network and its accompanying data services has not been completely settled at this writing; in oceanography, the oceanographic fleet has been cut by 25 percent.

Into this climate of arrested momentum comes a special research opportunity with implications in regard to natural disasters, energy resources, and the location of economic concentrations of mineral resources—the International Geodynamics Project. This project is an international program designed to gain better understanding of the dynamics and dynamic history of the earth in the light of the new concepts that have recently been developed concerning the origin of the earth's surface features. Over fifty countries are now participating. NACOA considers it in the national interest that there be a commitment by the government for U.S. participation both in assigned function and in specific support. The Geodynamics Project has a finite life—six years—and many other countries are looking to the U.S. for leadership. We have provided this in the past and should continue to do so in the future.

The reduction of the oceanographic fleet will have pervasive and long-felt effects. The oceans are a very poorly understood part of the world, remote and hard to get at. Men must go to sea to study them. While some observations can be made by remote sensing, as from satellites, there is no complete substitute for a platform from which one can read not only what

occurs at the surface, but at the depths below, on the sea bottom, and below that. Curtailing the opportunities to work at sea first hand is a major reversal of a long-sustained and highly fruitful policy by the leading sponsors of marine research, the Office of Naval Research and the National Science Foundation. Since historically the pace of this research has not kept up with man's use of the ocean, this cutback makes the gap grow larger. The increased and very welcome interest of atmospheric scientists in probing the effects of the sea on weather and climate add measurably to the demand for research. Thus it is by no means paradoxical that at the very time we can praise the current accomplishments of oceanographic work, we must express our concern for its future.

NACOA did not make its discussion of ocean research part of the Report. The issue of scattering rather than gathering the forces in oceanic and atmospheric matters enlarged to become central to the entire Report and details of ocean research are more technical than those of the examples we decided to use. But the principle is clear: *Underinvestment in the capital structure needed for marine and atmospheric research of the next decade could mean losing ground which would be costly to regain in later years.*

We also have made comment on the need for national planning for the U.S. fisheries, and for the necessary conditions of economic regulation and enforcement in addition to conservation and biological management. And we have called for an enlarged emphasis on small-scale weather forecasting and on better understanding of public response for improved dissemination of warning.

In our view, and for marine affairs especially, the theme of appropriate and undivided sponsorship needs application across the full range of the Nation's natural resources. We therefore urge greater centralization and more effective leadership of the Federal activities in natural resource management.

Natural Resources and Marine Affairs *

Marine and atmospheric resources offer problems in proper management which differ sufficiently from those on land to make it unwise to treat national activities offshore—or in the atmosphere—as mere extensions of what goes on on solid ground. On the other hand, management of our land, water, and atmospheric resources are so related and associated, so interactive, that to split them up organizationally is artificial, wasteful, and frustrates progress. In this chapter, NACOA deals with some of the difficulties generated by the currently fragmented treatment and suggests an organizational approach to correct it. NACOA's primary concern is that oceanic and atmospheric efforts maintain a focus which recognizes the unique and special characteristics of each.

NACOA finds that national management and organization of the Federal roles and missions concerning marine and atmospheric affairs is improving too slowly if, indeed, it is improving at all. There are too many actors, too many separate chains of command, too many crosscutting policies, too many separate budgets, appropriations, and programs. In this confusion, national priorities have no perspective and neither the Executive Branch nor the Congress is in a position to lead effectively, much less en-

* The organizational bond between the oceans and atmosphere, to which NACOA owes its existence, evolved in large part from the need to bring together the scientific research and observational activities going on because of the key role the oceans play in forming weather and in reflecting it. The users of atmospheric forecasts and other services are myriad, however, and no less terrestrial than they are marine, and include activities in the private sector as well as governmental. It is somewhat arbitrary, therefore, to locate atmospheric activities in one department rather than another. We include them in a department for natural resources because of the history of their relationship with the other activities, particularly marine. *We believe the present Federal organization for atmospheric affairs is generally excellent and should be preserved in any reorganization.* This is not the case with marine activities which are dispersed. Accordingly, we focus the systematic discussion in this chapter on the marine programs and deal with the atmospheric aspects only where they arise.

force accountability for results. Important leadtime has therefore already been lost and we are less able to deal with the problems of the '70s than we should be.

These problems include some of the most pressing and urgent of our times. Our domestic energy crisis cannot be resolved without, among other efforts, greatly expediting the development of our offshore oil and gas deposits. The dependence of many nations for food from the sea has encouraged multinational competition in fishing which is putting dangerous pressure on the world's fisheries. And not too far off there is the possibility of international competition for deep seabed minerals which could be unsettling.

These exploitive activities, engaged in by ourselves and others, increasingly threaten the marine and atmospheric environment. Since individuals generally cannot own portions of the sea and air, only government can reglate and coordinate the uses to which they are put in the interests of mutual compatibility and for the protection of the environment. The United States does not have the institutional capability to interact at this level on the necessary scale today.

The strength of our national economy is harder to sustain without healthy and productive marine resource development. In the face of an adverse trade balance, the near $1 billion annual payments deficit due to fish imports merits greater attention. The rapidly rising price of oil and gas hurts the pocketbooks of consumers directly. Our great dependence on imports weakens the dollar abroad, contributing to inflation at home. The decline of the U.S. merchant marine and our growing dependence on foreign bottoms for shipping, long deplored from the viewpoint of national security, deserves also to be looked at from the point of view of the impact on our place in the world economy.

Since the demand for resources is independent of its origin, there is no question but that national policies, legislation, and public and private investment in marine and land resources—and their management—should be seen in a total, balanced perspective. What this means is that marine and land resources belong together in a single department, as has been proposed, and that an appropriate top level policy and planning activity taking the broadest possible view be established to provide a unified overall framework for national resource development.

At the level of program and policy *application,* which involves the explicit choice of development strategies, and at the level of regulatory administration, marine and terrestrial resources development move into very different contexts. Ocean resources development differs markedly from resource development in the continental interior in questions of ownership and law, environmental hazards, personal and environmental safety, and the requisite science and technology.

At this level, we recommend that the proposed department be assigned the bulk of Federal activities and expertise required to:

- develop policy, programs, and strategies for marine and atmospheric resource development within the broader framework of natural resource development objectives;
- exercise marine area multiple-use coordination and regulation; and
- acquire and apply necessary scientific and technological knowledge, engineering capability, and services.

We discuss the purposes to be served and organizational arrangements for their achievements in what follows.

A DEPARTMENT FOR NATURAL RESOURCES

The case for bringing ". . . together in one agency most of the primary responsibilities and functions required to assure the most effective achievement of natural resources and related environmental objectives" was well made in the publication, "Papers Relating to the President's Departmental Reorganization Program." * We agree that, ". . . . since natural resources involve a coherent system of relationships among resources and with the environment, they need to be managed within a single organizational framework." ** And we certainly agree with the analysis that population growth, urbanization, industrialization and expectations of rising standards of living are putting increasing pressure on resource after resource, here within the United States and around the world, and make the proposed reorganization urgent.

We feel that the analysis presented, however, is incomplete. It displays a near total preoccupation with the problems of managing terrestrial resources and environments with little attention to those in the coastal zone and in marine areas where resource-environment relationships are so markedly different. The numerous studies of governmental reorganization which it cites as forerunners of its recommendations begin with a report of a Joint Commission of Congress to President Harding recommending the transfer of non-military engineering activities of the War Department and the functions of the Federal Power Commission to the Department of the Interior. They include among the many citations the recommendations by both Hoover Commissions. The first presented in 1949 a minority view to consolidate water resources and public land management functions in a

* Office of Management and Budget, GPO, February 1972, p. 121. At the time of this writing, this is the only published document available to NACOA that develops in detail the basis for the Administration's thinking on the new department. Although we are aware that several variations of the theme presented in the "Papers" are under current consideration, we are addressing the principles involved, and their application to marine and atmospheric affairs.

** *Op. cit.* p. 115.

Department of Natural Resources. The second Hoover Commission proposed in 1955 the creation of a Water Resources Board and assignment of the Soil Conservation function of constructing dams for flood control to the Corps of Engineers. Last mentioned is the June 1970 report to the President by the Public Land Law Review Commission recommending a Department of Natural Resources which would bring together the major public land agencies.

No reference, however, is made to any of the series of major studies and reports concerning marine resources and their management which had appeared during the last fifteen years. The series began with the 1958 National Academy of Sciences report, "Oceanography 1960-1970." It culminated in the Report of the Commission on Marine Science, Engineering and Resources, "Our Nation and the Sea," in 1969. The organizational and program content of what the Commission called the national program in marine and atmospheric affairs derived in part from several earlier studies by the Interagency Committee on Oceanography, particularly its 1963 report, "Oceanography, the Ten Years Ahead." Further development of these ideas took place in congressional hearings, especially those held by the Subcommittee on Oceanography of the House Merchant Marine and Fisheries Committee in 1965, and in the 1966 report, "Effective Use of the Sea" by the Panel on Oceanography of the President's Science Advisory Committee. The concept of a national program was given practical form and budgetary and programmatic meaning by the activities of the Cabinet-level National Council on Marine Resources and Engineering Development, established by Congress as an interim body in the Executive Office of the President and chaired by the Vice President. Its activities during the five years of its existence are reported in its annual reports, 1967 to 1971. These reports all testified to the meagerness and fragmentation of the national effort at sea, in the light of the prospective national need, and to the benefits to be found in more centralized management of Federal marine development efforts and the intimately linked atmospheric and oceanographic research programs.

The formation of the National Oceanic and Atmospheric Administration (NOAA) by Reorganization Plan #4 of 1970, is sometimes cited as solving Federal fragmentation in marine and atmospheric affairs. But, as noted in the "Papers" the formation of NOAA ". . . still left the related offshore oil, gas, and mineral resource, and earth sciences programs separately managed by Interior." * And this is far from the whole story. Interior also retained or has since been assigned programs with significant marine components in recreation (the Bureau of Outdoor Recreation, the National Park Service, the Bureau of Sport Fisheries and Wildlife), in water as a resource (the Office of Saline Water, the Office of Water Re-

* *Op. cit.* p. 117.

sources Research), in weather modification (the Bureau of Reclamation), and in coastal zone management (the Bureau of Land Management and the Office of Territorial Affairs). The U.S. Army Corps of Engineers and the U.S. Coast Guard also play very large roles in marine and coastal zone management, regulation, and public works. Highly significant roles are played by the Department of State, the Environmental Protection Agency, the Council on Environmental Quality, and, of course, NOAA. In marine and atmospheric science, general-purpose engineering development, and technical services we must include the Corps of Engineers, the Navy, the Maritime Administration, the Atomic Energy Commission, the National Aeronautics and Space Administration, the National Science Foundation, and the Smithsonian Institution, as well as Interior and NOAA.

To deal with this proliferation it has been necessary to create management devices such as coordinating committees, coordinators, and the like. The major ones are the Interagency Committee on Marine Science and Engineering (12 agencies represented), the Interdepartmental Committee for Atmospheric Sciences and the Federal Coordinator for Meteorological Services and Supporting Research (each with 13 agencies represented), and the Interdepartmental Committee for Marine Environmental Prediction (10 agencies represented).

But coordination is never enough. Coordination usually means *exchange* of information. Rarely does it involve table-pounding establishment of priorities, guidelines, and new policies to meet new problems. Especially when the budget gets tight, coordination is not by itself tough enough to protect multiagency programs. What happens is not so much that things get left out, though that happens, but that programs get distorted. Program cutbacks in one agency have side effects on others which change the overall program balance and priority without anyone really being responsible for what happened.

The distortion of some interagency programs is one of the key impacts of the FY '73, and FY '74 budget decisions in the affairs under NACOA surveillance. The effect, as is true of policies which result in underinvestment, is in the future, but it is nevertheless important. For example, the Coast Guard has been forced to abandon three ocean stations (as of June 30, 1973) and will have abandoned three more by mid-1974. The only remaining station will be *Hotel,* 200 miles off Delaware, which is occupied eight months of the year. But the ocean station's function of synoptic offshore weather and ocean observation is becoming *more* rather than less important to seagoing activities. While instrumented satellites will help with weather observations, it will be at least a year, and perhaps several, before NOAA's ocean data buoy program can be deployed to even partially fill the gap. Plans for additional buoys to fulfill this need have been included in future budgets, but the funding is in serious doubt. What was a

least-harm cut to the Coast Guard activities was a far more serious one to an interagency program in the oceans and atmosphere which, in a certain sense, belonged to no one.

Another example, the Nation's oceanographic research fleet—whose academic component is properly the joint responsibility of the Office of Naval Research and the National Science Foundation, and whose government in-house component is partly NOAA's and partly the Navy's—is being reduced by about 25 percent in FY '74. This is at a time when a long-cultivated collaboration between oceanographers and meteorologists is just beginning to show results and joint programs with foreign scientists are beginning to materialize. Though we are assured by these agencies—after the fact of these budget cuts—that ways have been found to avoid any very evident immediate impact, we have also discovered that none has a very good idea of the future and any semblance of a national plan is totally lacking.

Looking Ahead

The apparent lack of attention to marine affairs in the analysis underlying the proposed Department of Natural Resources in the "Papers" is most striking when one looks ahead. New national needs for whose fulfillment the Federal Government must assume broad leadership responsibility are generating severe strains in the Federal establishment, and these strains will grow unless eased by major realignment of responsibility with authority.

Take, for example, developing the oil and gas deposits of the Outer Continental Shelf. The President has announced a goal of tripling the annual rate of offshore acreage leased by 1979, implying among other things: the need for strengthening operating standards and surveillance to reduce the likelihood of oil spills; the acquisition and dissemination of general purpose geophysical survey data; the provision of marine geodetic controls (particularly for lease demarcation); improved knowledge of marine climatology, surface conditions, engineering properties of the ocean bottom; and the establishment of safety standards. The Department of Interior, NOAA, the Environmental Protection Agency, the Corps of Engineers, the Coast Guard, the Council for Environmental Quality, the National Science Foundation, and the Navy are all involved in one or another aspect.

The need for imported oil generates a need for building new offshore facilities by 1980 collectively able to handle annually up to 500 million long tons of crude oil carried by tankers of up to 500,000 dead weight tons. Projections indicate a need to increase the capacity by another 200 million long tons of crude oil per year by 1985. The legal regime for licensing beyond territorial waters must be determined. Environmental safeguards must be established and enforced. Navigation and traffic control systems

must be constructed and operated. Someone must develop and approve standards for operating and maintaining pipelines or other means to bring the fuel to shore for further inland distribution. Assuring their compatibility with other developments or activities will bring in state, regional, and local interests as well as interests of other nations.

The confusion over responsibility for these interlinked and complex matters is symbolized by current legislative approaches to control the development of deep-water ports. At least six major bills are in the congressional hopper now assigning lead-agency responsibility for such developments alternatively to Interior, Commerce, and the Environmental Protection Agency, and noting cross-jurisdictional implications with other agencies as well.

It is quite realistic to anticipate a rapidly growing need to control the siting of other offshore structures, floating, moored, or fixed, including: powerplants, airports, waste disposal sites, mariculture platforms, and recreational and living accommodations. The Federal Aviation Administration, the Environmental Protection Agency, the Maritime Administration, the Departments of Defense and State, and other Federal agencies, and state governments, have an active part to play in these developments, as of course does private industry.

A Department for natural resources must be organized in such a way that it can take a leadership role in moving ahead swiftly but surely with whatever projects are chosen for development.

OBJECTIVES OF MARINE RESOURCE MANAGEMENT

Organizational remedies for the above depend in part on the purpose to be served. We believe the new Department should undertake three related but managerially distinct tasks which apply equally to land and marine resources. In marine terms they are:

- encouraging the development and conservation of marine resources including offshore oil and gas, other minerals, and fish, and of other uses of the coastal and marine environment including recreation, waste disposal, siting of facilities, and transportation to meet national needs;
- coordinating and regulating these activities in the light of their environmental impact, national economic objectives, multiple-use conflicts, and international implications;
- providing technical, engineering development, and scientific services that cut across organizational lines, within and outside the Department, including surveys, environmental monitoring, prediction and control, and basic information relating to engineering and technology development.

The failure to recognize the significance of these distinctions regarding

objectives and their organizational requirements is, we feel, in part responsible for a number of imbalances in the present Federal programs. For example, we note elsewhere: a commercial fisheries program that is strong in science and advisory services but weak in a national fisheries development strategy; a weather modification research program whose NOAA component is criticized by some as not sufficiently application- or user-oriented and whose Department of Interior component is felt by others to lack scientific breadth; and an ocean engineering industry which during the 1960's developed, with Government encouragement, extensive underwater technology under the mistaken impression that Government was going to expand its support of marine resource development.

ORGANIZATIONAL MEANS TO MARINE RESOURCE OBJECTIVES

A simple regrouping of present activities within any such set of objectives as those discussed above is not itself any guarantee of progress. Most of the relevant activities, even those now within the same department, are deeply imbedded in a web of political processes involving both the Executive Branch and the Congress through the congressional committee structure. As always when fairly fundamental changes need to be made, it will take a special effort both in the White House and on Capitol Hill to bring about the conditions for any reorganization to succeed.

In addition to clear statements of missions and objectives for the new organization and its major components, it is important to assure that certain key functions are performed and that the organizational means to perform these functions exhibit certain desirable features.

The resource development activity must be able to establish resource production and usage goals in the light of supply and demand projections, determine the means required to achieve them, and bring these means to bear, subject to policy constraints regarding national priorities and environmental protection.

The multiple-use coordination and regulating activity must be able to determine the economic and social consequences of each proposed development activity, determine its prospective impact on the other development efforts and on the environment, determine the trade-offs of alternative policies, regulate their execution in accordance with broad national goals, and plan, fund, and arrange for the carrying out of public works of national importance.

The scientific, engineering, and support services activity must assure the timely availability of the necessary scientific and other knowledge, and provide appropriate technical and scientific services where the benefits accrue to the public at large.

The new organization should be charged with:

- Working closely with private enterprise and of encouraging industrial

activities which will carry out the Nation's interest in marine resources because of the large capital investments needed and the private enterprise role in resources development.

- Maintaining an extensive and deep understanding of the marine resource objectives and activities of other nations, and working effectively in the international arena in accordance with national policy because of the enormous potential marine affairs has for international cooperation or conflict.
- Supporting and managing large-scale oceangoing and atmospheric facilities and experiments because of the nature of the ocean environment, its physical coupling with the atmosphere, and the essentially global extent of both.
- Establishing regional foci when necessary and working with the States because of the inherent local nature of many marine resource-related coastal problems.
- Maintaining a working relationship with universities and other research and development institutions through grants and contracts because of their large role in the conduct of oceanographic and atmospheric research and educational programs.

Two final attributes that we consider essential:

- The administrative levels for marine and atmospheric resource management responsibility should be commensurate with the administrative level for the management of land resources.
- The Department must coordinate its programs with the essential oceanic and atmospheric missions of other agencies such as those in the Department of Defense, the Environmental Protection Agency, and the National Science Foundation.

RECAPITULATION

NACOA concurs with advocates of a greater centralization and more effective leadership of the Federal activities in natural resource management. We support the concept of a Department of Natural Resources along the general lines developed in "Papers Relating to the President's Departmental Reorganization Program" published in February 1972.

However, we note therein a preoccupation with problems of terrestrial resources development and an inadequate assessment of both the opportunities and problems of developing marine resources.

These problems involve special relationships between resources and the marine environment quite different from those on land. They produce correspondingly special operating situations and special technological requirements as well as vastly more complicated issues of ownership, jurisdiction, and law. Although we agree that, at the highest policy and planning levels, the role of marine resources must be developed in a national re-

sources context involving all resources regardless of origin, we believe that at the policy implementation level the Department's organization should show a special marine focus by the way its oceanic, atmospheric, and other environmental activities are grouped.

Atmospheric affairs do not in general present the same problems of intermingling as do marine affairs. But weather modification, for example, also has specific operating situations, technology, and complicated legal issues of ownership and jurisdiction which are similar to those of the sea.

Detailed internal organization for marine and atmospheric affairs cannot be confidently recommended without knowing how the nonmarine resource management activities are to be organized. There is more than one way to do the job, but there are certain functions and principles which should be provided for by whatever the groupings are of programs and activities. The functions we see as particularly important to keep in mind are those of (1) marine resource development in fulfillment of production goals, (2) multiple-use coordination and regulation in the light of their impact on each other, the environment, and international agreements, and (3) the provision of the scientific, engineering, and support services to meet the multiple needs of the public, the government, and industry.

The need for a special marine focus for the second of these functions (multiple-use coordination and regulation) is in particular danger of being overlooked. Unless this function is adequately provided for in the new Department, the special problems and opportunities in making effective use of the sea are unlikely to be dealt with adequately in formulating overall national resource policy and plans, in exploiting individual marine resources to help meet national resource goals, or in acquiring and making available the marine and atmospheric knowledge and services required for these and other sea-going projects and operations.

RECOMMENDED ORGANIZATIONAL GROUPING

There is no unique organizational solution to the marine resource development objectives stated above. Furthermore, we are aware of practical and political feasibility problems and the not trivial consideration of key individuals and their qualifications. Special influences will, of course, be the new Secretary, his wishes, and the way the nonmarine portions of the Department are organized.

Nevertheless, we recommend that as the plans for the new Department evolve, consideration be given to the groups discussed below.

Science, Engineering, and Support Services

We suggest that the science, engineering, and support services component of a natural resources Department be built around the present NOAA (ex-

cept for its Coastal Zone Management Program) and Interior's Geological Survey. It could reasonably include the R&D Laboratories of the Corps of Engineers and the R&D program of MARAD. It would logically include the research and service components of the Bureau of Sport Fisheries and Wildlife, and possibly some parts of the National Science Foundation's IDOE (International Decade of Ocean Exploration) program.

It should also develop a research grant program with key nongovernmental laboratories and universities not subject to the restrictions placed on NOAA's Sea Grant program in the support of ships, platforms, and essential shore facilities. It is important that this not be done at the expense of ONR and NSF programs. The academic community is of great value to ONR and NSF who, over the years, have developed a capability for effectively using this outstanding scientific competence.

In view of the strong technical content of science, engineering, and support programs and their methodological similarities and mutually supportive and cross-fertilizing properties, we recommend a single administrator be given the responsibility for their management. Needless to say, he should be highly qualified in science, engineering, and technology management.

Pending the buildup of a satisfactory in-house capability, a special need exists for using the unique technical competence of naval personnel and facilities to expedite the transfer of naval ocean technology developments to civil applications of industry and government and to insure that there is a minimum of duplication and maximum coordination of effort in this technology within the Federal sector. As an immediate action, an appropriate naval official, such as the Oceanographer of the Navy, could be designated the Federal Coordinator for Marine Technology Development. In his role as Coordinator, the Oceanographer would be required to submit to OMB annually his assessment of past Federal action and his plan for future activities. A similar Federal coordination mechanism and authority has been very effective in the area of atmospheric science.

Multiple-Use Coordination and Regulation

We recommend that the organization for marine multiple-use coordination and regulation be developed around NOAA's Coastal Zone Management Office, expanded to include the Corps of Engineers' civil functions, MARAD, and the Coast Guard. It could also include portions of the Bureau of Land Management, the Economic Research Service, the Bureau of Sport Fisheries and Wildlife, the National Marine Fisherics Service, and the Bureau of Outdoor Recreation.

A strong effort should be made to build a major capability into this part of the new Department. It is not an exaggeration to say that this office should be developed into an activity which can provide the analytical

basis for policy and planning decisions for a national marine affairs strategy and oversee its implementation through its public works, permit, regulation, and enforcement programs.

This further depends heavily on close interaction with the full range of technical and other services provided by the science, engineering, and support services organization referred to previously.

Resource Development and Conservation

If a coherent organization for marine affairs coordination and multiple-use management were developed to the extent recommended, much of the uneasiness we feel about a possible loss of marine focus, position, and support in the resource exploitation portions of the Department would be relieved. With the exception of fisheries, marine aspects of other resources development, such as energy, minerals, ports, transportation systems, and recreation could very well be grouped organizationally with their terrestrial counterparts in the Department along the lines suggested in the President's Reorganization Program Papers, where Administrators for Energy and Mineral Resources, Water Resources, and Land and Recreation Resources are identified at the top line management echelon.

Fisheries is a special case, since its terrestrial counterpart is in a different Department, Agriculture. Also, although both NOAA's National Marine Fisheries Service and Interior's Bureau of Sport Fisheries and Wildlife have competence that would contribute to reasonable U.S. development and conservation goals, the global reach of fisheries problems is such as to suggest a high level spot where its voice will not be lost.

The New Emphasis

Given all this, our recommendations for marine and atmospheric affairs differ from those of the Reorganization Program Papers of 1972 primarily in the expansion of the role and program responsibilities of the Administrator for Oceanic, Atmospheric, and Earth Sciences, the establishment of a major additional function (that of marine affairs multiple-use coordination and regulation), and the establishment of an office of marine living resources.

We recognize that it takes time both to form a new Department and to have it evolve into an effective working unit once formed. NACOA intends to continue its discussion and commentary during all of this process. But for now, making the right kind of a start is the pressing national business.

Energy and the Oceans

The oceans must play an increasing role for the United States during the next 15 years as we are forced into a difficult transition from primary reliance on domestic terrestrial sources of fuel to substantial use of energy from offshore oil and gas, from foreign oil and gas, and from nonconventional sources. NACOA believes that time is at a premium in balancing proper safeguard of the environment with the Nation's need for the production of offshore oil and gas, the importation and refinement of crude oil, and the placement of power plants in the coastal zone. NACOA considers that the ocean is a medium in which substantial development of energy-related activities can take place at less environmental cost than can similar growth on land. Its use for such purposes should be furthered.

A Difficult Transition Period

The energy crisis describes a difficult transition period of perhaps 15 years as we are forced to go from reliance on domestic conventional crudes for 65 percent of our national energy needs in 1971 to substantial utilization of crude oil from nonconventional sources, increased reliance on offshore oil and gas, buildup of our nuclear capacity, development of other sources such as geothermal and solar energy, and the importation of much greater quantities of foreign oil and gas.

NACOA concerns itself here with the part the oceans should be expected to play in meeting the growing demand, for the problem of energy will pervade most aspects of problems of high national priority in the decade to come and no possibilities can be left unexamined.

Crude Oil and Natural Gas Situation

The domestic price of crude oil is rising as our supply situation tightens, being above $4 per barrel for some low sulfur crudes. At this price it is becoming economical to inject chemicals along with water to improve oil recovery. Industry now recovers, on the average, slightly over 30 percent

of the oil in place in known reserves. With advances in secondary and tertiary techniques, the average recovery from known reservoirs could reach 50 percent or more, adding in excess of 70 billion barrels to reserves.

If the price continues upward, crude oil from unconventional sources will become economic—first from tar sands and heavy crude deposits, then oil shale, and finally from coal.

At the present time crude oil and natural gas supply over 75 percent of our total energy requirements. Economists predict that by 1985 our demand for energy could nearly double the 1970 level but still with petroleum and natural gas as the major source (65 percent). Thus U.S. reserves* of crude petroleum, now at a peak, can be expected to decline. Over the past 15 years proven reserves of crude oil in the lower 48 States have fallen from an equivalent of a 12-year supply to a 9-year supply. Similarly, proven reserves of natural gas have dropped from a 22-year supply to an 11-year supply. In 1972 imported crude and petroleum products supplied about 25 percent of our domestic demand and this percentage was increasing rapidly. The 1985 imports will probably exceed 50 percent unless substantial new domestic discoveries are made and exploited. A substantial increase in importation of liquified natural gas is also forecast.

Hydrocarbons can be derived from our very large deposits of coal and oil shale, but it will be from 10 to 15 years before these sources can be utilized economically in large quantities without significant damage to the environment. Conceding that this technology will be available, it is still very important for the United States to remain economically competitive in terms of its basic cost of energy.

The near term domestic energy resource shortage is a consequence of this required transition over the next 15 years. It can be minimized by: (1) increasing our petroleum discovery rate with particular emphasis on offshore resources; (2) importing more foreign crude and natural gas; (3) increasing the percentage of oil recovered from known reservoirs; and (4) realistically working to control the demand side of the equation—certainly not the least important.

The oceans will play a very important role in the first two of the foregoing approaches.

Offshore Oil and Gas

The most promising way to increase our domestic discovery rate is for an intensified exploration and drilling effort offshore on the continental margins. The U.S. onshore, excluding Alaska, has been one of the most

* Proven reserves are reserves of oil and gas that exist in known reservoirs and can be produced with known technology under existing economic conditions. New discoveries, improved technology, and increase in price all have the effect of increasing the reserves.

intensively explored regions of the world. The opportunities for finding new large reserves onshore are now limited and most of these will probably be deeper and more costly to find and produce.

Geologists regard the Outer Continental Shelf and slope of the United States and offshore Alaska to be generally favorable prospective areas for oil and gas. Recoverable hydrocarbon resources on our Outer Continental Shelf have been estimated by the U.S. Geological Survey to be upwards of 160 billion barrels of crude oil (four times proven reserves at year-end 1972) and upwards of 800 trillion cubic feet of natural gas (three times proven reserves at year-end 1972). Comparable amounts are also possible on the continental slope. How much will eventually be found or produced from either of these areas will depend on technical, economic, and political factors. Offshore production is already established in Louisiana, Alaska, and California.

Offshore oil and gas drilling and producing operations encounter substantially different environmental conditions from those onshore. In addition the offshore, being in the public domain, supports a complex and varied mix of activities—fishing, shipping, recreation, and defense as well as exploitation of the mineral and petroleum resources beneath the sea.

Harmonizing all these operations is no easy matter and efforts to develop this domain are being opposed by major environmental groups who, concerned by possible adverse consequences, have brought drilling operations to a near halt in offshore California, slowed lease sales in the Gulf of Mexico, proposed legislation to ban leasing and drilling operations off the East Coast, and have entered suit blocking the Trans-Alaska pipeline from the North Slope. The construction of new refineries has also been affected. In past years four or five major new refineries or major expansions, with capacities of 100 to 200 thousand barrels each per day, were under construction at any given time. Today there are none. One important reason is because the oil companies have found it difficult to obtain siting which satisfies economic and environmental criteria.

Safeguarding the Environment

Industry, as part of an increased environmental awareness is spending large sums on research to develop new technology to reduce risks of well blowouts and spills and on techniques to confine and clean up the oil should accidents occur. The Coast Guard is taking the Government lead in the cleanup area. Numerous studies sponsored by Government and industry have focused on the impact of various offshore operations (drilling, producing, and transportation) on the biological, chemical, and physical environments both at sea and along the strand.

Industry is also pressing the development of new technology to place well heads and production systems on the sea bottom, thus allowing a

breakaway from the surface to concentrate on totally submerged operations in an environment unaffected by weather. The industry expects that this technology will cause the curves that show costs rapidly rising with depth to be discarded and replaced by ones that increase only moderately with depth. The near term goal is to have wells economical in 1000 feet of water. Such systems will be beyond the reach of storms, high seas, and ship traffic—hazards to which fixed production platforms that extend above sea level are now exposed. Subsea systems, of course, have potential hazards of their own, but there seems to be no fundamental reason why they could not be handled.

Of the more than 17,000 wells drilled in our offshore only a handful caused problems, and there seems to be little hard evidence of long-term environmental damage from those that did (although this question is not entirely closed), and the short-term effects can be and have been severe. From experience in oil production in the Gulf, less contamination of the ocean apparently results from offshore drilling, production, and pipelining to shore than by shipping in a like amount of oil by tankers.

NACOA feels that one of the top priority Government functions should be to establish environmental norms in the offshore and along the strand and to provide environmental forecasts of sea-states, currents, biological background, and chemical pollution. Such norms are essential to setting pollution control and siting regulations. Once the norms are established periodic monitoring should be maintained to recognize changes and to help determine whether these are due to natural causes or to industrial activities and in the latter instance what control measures are indicated. Forecasts would enhance safety and help protect the environment. Government geophysical surveys should provide a general overview of the sub-bottom structures. Where necessary, special emphasis should be placed upon data needed to ensure safe procedures for exploration and recovery operations.

Financing offshore exploration, drilling, and production can and should be done by the petroleum industry. However, since such operations will be done in areas largely under Federal jurisdiction, it will be necessary for Government to establish regulations that will provide protection for the ocean environment, and compatibility of petroleum operations with other activities within the coastal zone, while allowing proper incentives for the petroleum industry to enable it to generate the very large capital funds required to develop these offshore petroleum resources. Also, regulation should not be such as to jeopardize other international positions on offshore questions.

Deep-Water Terminals vs. Deep-Water Ports

While we fully expect efforts to encourage discovery rate, improve recovery efficiency, and control demand to be successful, it will be essential

that a very substantial increase in imports of petroleum be accommodated over the next critical 15 years. This means that we will need, in the very near term, deep-water facilities to offload the large tankers needed to handle the anticipated tonnage safely and economically.

As our dependence on foreign crude increases, more and more tanker traffic will enter U.S. ports. Foreign flag tankers of 200,000 dwt are common today, an increasing number of 300,000 dwt tankers are in service, and several in the 500,000 dwt range are under construction. These large tankers reduce sea-leg transportation costs markedly. Only one U.S. port (San Pedro, California) can handle a tanker as large as 120,000 dwt, although Seattle, Washington, could be adapted, and Machiasport, Maine, though undeveloped, has the requisite depth as does Eastport. Though Long Beach, California, is deepening its main channel to 62 feet, which could accommodate 200,000 dwt tankers, dredging present ports on the East Coast to suitable depths is either impossible or presents many drawbacks.

Deep-water oil terminals that can accommodate large tankers are one alternative to dredging present ports and could be financed by private industry. Government action would be needed in regulating siting and in protecting the ocean environment. Three deep-water oil terminals are presently under active consideration—Sea Dock near Freeport, Texas; Loop, near Grande Isle, Louisiana; and one off Delaware. Most of the deep-water facilities built in many locations around the world use single point moorings (SPM) and provide a capacity for a 24-hour turnaround for any size oil tanker. An advantage of SPM's is that they enable tankers to ride out storms with a minimum of risk.

There has been considerable attention given to the alternative of superports to handle a variety of bulk commodities. These could be sited on manmade islands offshore or sited on coastal lands. If superports are used in place of specialized oil terminals, most of the tonnage passing through such a superport, at least in the beginning, would be crude oil and refined petroleum products. Since such a large percentage of superport tonnage would be liquid petroleum needing special handling facilities, NACOA believes it would probably be preferable, at least initially, to use deep-water oil terminals independently of superports. Such an arrangement also has the advantage of making oil terminals, because of their relative simplicity, available at an earlier date—an important consideration—and could be financed by the petroleum industry. Also, problems of colocation are avoided.

The combination of SPM's and accelerated offshore leasing offers the shortest lead time for increasing crude oil capacity. We believe that provision of terminal facilities is vital. NACOA therefore recommends that: as a quick fix the United States have at least one deep-water single-point

mooring terminal operational in the Gulf by 1976, and have at least one deep-water single-point mooring terminal operational off the East Coast by 1978. Some such facility will eventually be needed on the West Coast; but its nature, because of the different alternatives and different conditions, is not as easily determined.

Siting—A Pressing Problem

Siting is a problem for energy-related facilities. Terminals associated with imports or offshore development must be in the coastal zone. While other facilities, such as refineries and powerplants, can be located elsewhere, cooling water availability and reasonable access to the consumer make the coastal zone attractive. But the coastal zone, as is increasingly evident, is attractive to many other uses—not all of which are compatible. How does this balance out?

It is natural to want facilities such as big powerplants, refineries, etc., located far from where one lives and some have suggested that in order to avoid building more, we simply curb our demands for energy. There is no question that conservation and efficiency should be a vital part of our national energy policy and that reducing demand would buy some time. However, it will take more than a substantial modification of our life style to negate the present need for new facilities. The projected annual growth of energy demand is given at 3.4 to 4.4 percent per year; the demand for electrical power is going up even faster and has been doubling every ten years for an annual growth rate of over 7 percent. This would be slowed by a change in demand, but to think it can be stopped, for the present at least, is unrealistic. The siting problem for new plants, in other words, won't go away.

Nuclear generating plants are destined to play an increasingly important role in meeting the Nation's electrical energy needs. Today, there are 34 operable nuclear powerplants in the United States; they provide a capacity of about 19 gigawatts (billions of watts) which is approximately 4 percent of the Nation's electric power capacity. Fifty-seven new nuclear plants are under construction, and 80 more have been ordered. Nuclear plants are expected to proliferate for the balance of the century at a rate approaching 20 percent per year. By the year 2000, installed nuclear capacity is expected to be 1200 gigawatts and to make up roughly half of our total electrical generating capacity.

One of the unavoidable byproducts of electrical generating systems, whether fueled by nuclear, coal, oil, or gas, is waste heat. In general the conversion of 1 BTU into electrical energy requires the release of 2 BTU's to the environment as discarded or waste energy. The rejected heat is normally transferred to a supply of cooling water taken from and re-

turned to a river, lake, or the ocean, or recycled through a cooling tower or pond where some of the water is consumed by evaporation.

The point is, the waste heat must be dissipated somewhere into the environment or used for purposes other than conversion to electricity. Improved powerplant efficiency can help extend our fuel supplies and also lessen cooling requirements. Since the oceans contain over 97 percent of the world's water,* their use as a heat sink should have the least noticeable effect on the environment. Many electrical generating plants should thus be sited to take advantage of the excellent heat absorbing capacity provided by the oceans. Nine nuclear powerplants in the United States are presently in operation at sites on bays or tidal rivers. The influence of their cooling water discharges into the ocean can be minimized with detailed knowledge of the existing physical and biological factors.

If upwards of 1000 nuclear plants are required by the end of the century, as is anticipated by some industry projections, some fraction should and will be situated in the coastal zone. To accommodate them, new approaches to coastal siting are being explored with an eye to conserving land. One is the construction of so-called "nuclear-parks" in which a number of nuclear generating stations would be clustered at a single location. Another sites nuclear powerplants offshore on floating "islands" inside protective breakwaters. Other energy generation and energy conversion facilities can be envisioned that would benefit by ocean siting.

NACOA stresses that an accommodation must be reached between the legitimate concerns for our environment and the energy needs of a dynamic society. NACOA feels that both can be substantially satisfied if available technology is utilized and if a concerted and unified effort is made to carefully weigh the alternatives and then move ahead. NACOA feels that the oceanic solutions to many of these problems have not received as much attention as they merit.

NACOA feels that a national objective of our ocean program should be to have the technology and environmental information in hand such that decision-makers can judge the consequences of proceeding with offshore oil and gas development as well as the placing of new energy-related facilities safely and economically in offshore waters. Several advantages can be identified. First, more coastal land could be retained for recreation or for wildlife preserves. Second, adequate cooling water could be obtained without the often severe problems associated with thermal discharges in restricted water. Third, by placing the facilities remote from people and in many cases placing them on the bottom, well below the turbulent environment of the surface, it is possible to design in much improved safety features. In short, progress doesn't have to mean a degraded environ-

* Roughly 2 percent is tied up in icecaps and glaciers and less than 1 percent is in fresh water lakes, streams, and groundwater.

ment. If properly done we can have both the needed energy as well as an improved environment. NACOA stresses the need for increased emphasis on improved ocean technology on the part of industry and government in support of their respective responsibilities.

Managing the Coastal Zone

NACOA supported the Coastal Zone Management legislation enacted October 1972 for two principal reasons. First, the legislation provided strong coupling between the technical and scientific expertise and the management functions needed for the coastal zone. Second, the legislation closely matched, supported, and could be expected to further coastal zone management in many states. But the Act was neither funded in FY '73 nor included in the budget requests for FY '74. In this chapter, NACOA discusses the consequences of delaying implementation on various matters of high national priority, finds them to be costly, and recommends a substantive start in funding existing legislation.

Introduction

In the United States, as in other developing nations of the world, awareness of the importance and vulnerability of the coastal zone is increasing. The Commission on Marine Science, Engineering and Resources (The Stratton Commission) established clearly the aesthetic, social, economic, and environmental problems pertaining to this complex, dynamic, and yet fragile area and recommended a national program. Many other political, industrial, private, and scientific bodies have reinforced these conclusions—recommending positive action. NACOA in 1972 strongly urged enactment of legislation establishing such a program. In late 1972, Congress passed and the President signed into law P.L. 92-583, the National Coastal Zone Management Act. Subsequently, the Secretary of Commerce established an office within NOAA to administer the Act. Progress, eagerly sought by many, seemed finally under way.

Unfortunately, though the National Coastal Zone Management Act had been duly enacted, complete with authorization of expenditures, no appropriation was sought in a supplemental FY '73 request or in the budget request for FY '74. The program, presently sustained only by meager caretaker funds squeezed from the beleaguered budget of NOAA, has been suppressed to a very low level.

Inasmuch as the coastal zone encompasses those areas of the oceans and the margins of the land which relate most directly to the current big-E issues—Environment, Energy, and Economics—this lack of aggressive action on an approved national program which bears so strongly on all three could have serious economic, social, political, and environmental repercussions.

Because of the sensitivity of this critical geographic area and of our concern for the future of the coastal zone—a concern shared by many groups and individuals—NACOA has had all aspects of coastal zone activity (Federal, state, local and industrial) under relatively constant review for over 15 months. This review only confirms and reinforces prior convictions. We see no reason to moderate the stance or alter in any way the recommendations made in the 1972 Report.

Why Delay?

NACOA understands that several concerns (perhaps among other less obvious factors) were involved in establishing the current holding pattern on the Coastal Zone Act. Among them are concerns over: (a) compatibility of the provisions of the Coastal Zone Act with total land-use management on a national scale, (b) departmental assignment, and (c) budget limitations.

Since the Coastal Zone Management Act was made compatible with the several land-use proposals even before it was enacted, this concern seems unnecessary. It is understood that the congressional proponents of each have agreed on details for coordination.

Assignment of the program to the Department of Commerce in the 1972 Act was justified, NACOA believed, because "the Committee feels very strongly that there should be strong coupling between the information-gathering and the management functions." * NACOA went on to say ". . . the fact that the Department of Commerce, with NOAA, would have the primary Federal responsibility for implementation of this program . . . assures the opportunity of this coupling." ** We still believe the assignment was justified! In the light of possible reorganization of environmental and resource management and technical agencies now being widely discussed, the concern regarding the assignment to Commerce is further weakened. Regardless of the outcome of the proposed reorganization of environmental and resource management agencies within the Federal Government, development of an effective national coastal zone management program is so important that continued delay on this ground seems unwise.

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* "First Annual Report by NACOA," *op. cit.*, p. 39.

** *Ibid.*, p. 39.

Economic concerns, the need to keep governmental expenditures to a minimum, are more substantive arguments for delay, even though the costs of initiating the coastal zone management program seem low compared to others which were supported—especially in terms of desirable priorities and potential productivity. However, the obvious short- and long-term economic importance of achieving reasonable control over the environments and resources of the Nation's coastal margin is so great that this particular budgetary squeeze could very well be counterproductive.

The Need for Action

With passage of the National Coastal Zone Management Act of 1972 and the vigorous beginnings undertaken by NOAA, NACOA was encouraged to expect that confusion would diminish and order emerge. Unfortunately, while lack of funding has limited Federal activity to some planning and fact-finding efforts, the scene at the State level has been in ferment. Individual States have taken action. For example, California passed Proposition 20, which brought into being California's Coastal Zone Conservation Act of 1972. The Virginia Wetlands Act of 1972, an attempt to control by permit the use of intertidal lands which since 1819 have been in private hands, was also enacted. The Delaware Legislature declared a 1-year moratorium on coastal development while a group of experts was tasked with providing guidance for Delaware's long-term coastal zone utilization. Other States have taken action. Some have been comprehensive, encompassing the entire coastal areas, as in the California and Delaware cases. Others have been more narrowly focused on specific segments, like the wetlands in Virginia. NACOA is aware that many other management activities are underway at State and local levels and that planning is being carried out by many others.

NACOA is pleased to note this vigorous action, believing that it is ample testimony to the criticality of the coastal zone, but certain aspects of its management must be truly national. The people and economic activity of the heartland as well as the coastal area are closely dependent upon the metropolitan centers, ports, internal waterways, oceanic lanes, mineral and fishery resources, and the recreational and aesthetic resources of the margins of the seas and the Great Lakes. Too, regional (interstate) needs exist. A great danger exists in unilateral and uncoordinated action by State and local governments. Local, State, regional, and national interests are often in direct conflict when offshore developments like deep-water ports, oil exploration, and production platforms, and other nationally or regionally important projects are proposed. The management and utilization of living resources of the coastal zone has proven to be a continuing area of irritation and disagreement. Conflict and problems between States and regions are yet to be resolved. Persistent conflict has seriously impeded

and often halted progress needed for the benefit of many at the expense of local benefits for few. The National Coastal Zone Management Program should, as a matter of high priority, be provided the means needed to effect better State and local coordination and assure that regional and national interests will be fairly served.

Balanced and Responsible Concern

Lest we be misunderstood because of this emphasis on national and regional needs, for effective utilization of the coastal zone, NACOA reaffirms its keen interest in bringing coastal waters, coastal bottoms, and the coastland areas under balanced and responsible control in the light of environmental imperatives. We advocate preservation of unique areas of biological importance, active conservation of open space and natural areas where threatened, and limitation of development to areas and amounts justified by the criticality of basic societal needs like energy and transportation. However, we are convinced that in many instances, ways can be found to allow reasonable usage with tolerable or no damage. We do not believe that it is in the best interests of the people of this country or of any State to eliminate or permanently impair effective use of the region. We are convinced that the Coastal Zone Management Program is best pursued and funded under an arrangement whereby State governments and the Federal Government participate together within effective national guidelines as was provided for in the Act.

Research and Development in the Coastal Zone

To aid rational management of the resources and environments of the coastal zone, increased research and engineering activities will be required. Baseline environmental studies are needed, resource location and evaluation are required, and new and/or more effective means of conservation, use, and preservation are necessary. A number of Federal R&D activities are relevant. For example, the Sea Grant Program of NOAA, certain National Science Foundation projects, the MESA * program of NOAA, the fisheries programs of NOAA's National Marine Fisheries Service and Interior's Bureau of Sport Fisheries and Wildlife (i.e. P.L. 88-309 and P.L. 89-304). There are others. Unfortunately, serious reductions in funding of most, and in the rate of growth in others, have resulted from the recent budgetary impoundments and reduced requests for FY '74. Some vessels used for coastal, environmental, and fisheries-related work have been deleted from the fleet. This general cutback is unfortunate since solution of the economic and environmental problems related to the coastal zone depends on improved knowledge of the processes and phe-

* Marine Ecosystems Analysis.

nomena. Baseline data are needed and design, construction, and operation capabilities are required if we are to manage the coastal zone well. The price of inadequate information and lack of design and engineering data, skills and equipment will be faulty design or overdesign. Each of these shortcomings reduces the ability to manage effectively and frequently results in economically significant overexpenditures, even losses. Improvement and even expansion of the effort in this area is clearly justified on grounds of its relevance and importance to solution of the major problems of the time and of the future.

Summary

The passage of the Coastal Zone Management Act of 1972 was a milestone of national importance. It was, however, followed directly by an Administration decision not to fund the program for fiscal years '73 and '74. While the Federal Government is marking time, many of the states are moving ahead in the best way they can, and some confusion has begun to appear due to lack of a properly funded Federal program.

Basic scientific knowledge and technology relative to coastal environments and resources are inadequate to the tasks ahead. Decisions are going to be made based upon the knowledge available. In many cases the price of this dearth of information and technological inadequacy will be gross overdesign and the resultant economic penalties. Coastal fisheries and biological research, particularly the biological information needed to make rational decisions on resource development and utilization, appear grossly underfunded.

NACOA strongly recommends and urges that the National Coastal Zone Management Act of 1972 (P.L. 92-583) be funded to the full amount authorized by law and that its implementation in all aspects be vigorously pursued. NACOA also recommends that the budgetary priority be increased for R&D programs bearing directly on the coastal zone management planning and regulation decisions.

Atmospheric Activities

The United States has led in the remarkable advances of recent years in observing, describing, understanding, and simulating large-scale atmospheric behavior. NACOA finds it is now time to increase the relative effort on smaller-scale meteorological phenomena which nevertheless have large local impact—flash floods, tornadoes, severe hail, etc.—and to improve local forecasts. NACOA also recommends greater attention be paid to monitoring the public response to weather forecasts and warnings so as to improve the ultimate effectiveness of dissemination and to increase its value to weather sensitive activities.

Although we appear to stand on the threshold of practical weather modification, and some limited aspects are now operational, not enough is known about it to make it ready for general operational use. In addition to unsatisfied questions in domestic and international social, legal, and economic areas, a great deal of physical research still needs to be done. Last year NACOA recommended focusing and coordinating the many small research programs now scattered widely through the Federal agencies. NACOA again recommends this be done and again recommends assigning NOAA lead agency responsibility because it has the bulk of the scientific expertise both theoretical and experimental.

Introduction

The last decade has been a period of remarkable advance in the atmospheric sciences. Perhaps the outstanding achievement has been the great strides made in observing, understanding, describing, and modeling (through computer simulation) the large-scale behavior of the atmosphere. This effort has had as a major objective extending the accuracy and the period for which reliable forecasts can be made. A secondary objective, of growing importance in the light of man's increasing intervention, is understanding the processes of climate change.

The United States has led the way in this effort, notably in the Global Atmospheric Research Program (GARP). Universities, NOAA, NSF, and DOD, using computers, satellites, aircraft, ships, buoys, and balloons, have coordinated to a remarkable degree both the organization and planning

of a well-conceived graduated series of observational and computer simulation experiments. This effort culminates towards the end of this decade in an experiment with strong international participation. We believe the practical and scientific benefits in prospect justify strong support for this program through its remaining phases.

While acknowledging this scientific and organizational achievement, and supporting the determination to carry it through to completion, NACOA recommends that greater attention now be paid to the problems created by weather and environmental phenomena at the other extreme, those that are of small or medium scale, geographically limited, short-lived, and exceptional in the sense of being at the same time both hazardous and infrequent in any one spot. We are referring to flash floods, tornadoes, severe hail storms, pollution "hot spots," sudden crop-damaging freezes, and short-term fluctuations in phenomena of great importance to operations, such as airport ceilings and visibility, and anomalous wave heights at harbor entrances, near shore, and at sea.

These phenomena share a number of properties that require a special approach in providing appropriate services. Reporting the occurrence of specific events in time for appropriate action becomes more important than scientifically exact descriptions of the phenomena themselves. In urging greater emphasis on the development of "user-oriented" forecast systems designed for hazardous situations, NACOA also notes that closer attention to user needs could pay off in increasing the usefulness of the daily, more or less routine, weather prediction services.

Natural Disaster Warning

During the fall of 1972, NACOA carried out an evaluation of the performance of the national weather and flood forecasting-warning-dissemination system during Hurricane Agnes. There were $3.5 billions in property destruction—a new record—and 118 deaths. Hurricane Agnes put the capabilities and skills of the Nation's weather and flood warning system to a severe test.

As is customary after disasters of such magnitude, Dr. R. M. White, Administrator of NOAA, assembled an in-house Survey Team to gather detailed firsthand information from the weather service units involved, and from the communities affected by the flood events of Agnes, to assess the effectiveness of NOAA's storm and flood warning services and to profit from the experience. Dr. White asked NACOA to make an independent evaluation of NOAA's performance because of the magnitude of the calamity. What the NACOA panel asked of itself was whether these losses could have been avoided or diminished by more efficient warning service performance.

NACOA reported its findings to the Administrator of NOAA in a special report made public in November 1972.* NACOA concluded that, "While the technical and administrative resources of NOAA could be improved in certain respects, and work must be done in the area of public response, *primary effort must be focused on the warning delivery system.*" ** We wish to discuss further in this report the matter of delivery of warnings and forecasts.

Improving Delivery and Public Response

An effective warning delivery system must be capable of detecting an impending disaster, determining its scope, deciding on the type of warning to be issued, and disseminating the warning. On its part, the community thus warned must be prepared to take appropriate action. All of these components must function properly and quickly if lives and property are to be saved. The response time from detection to public action must be made short. While the Weather Service does not have the responsibility for public response, it shares responsibility with other agencies for final delivery to the public, and it does have the responsibility of assessing how successful to the whole is its part of the effort.

The National Weather Service (NWS) uses a number of arrangements for transmitting forecasts and warnings to the public. Many of the methods currently used are indirect. The mass media (radio, television, and newspapers) relay what is furnished them by the NWS, and, in some areas the public is reached through State and community action agencies. In other locations, the NWS communicates directly with the public both by telephone and through the use of continuous broadcasts over special VHF-FM radio transmitters. More extensive use of cable television is an emerging possibility for increasing direct contact with the public. None of these methods is entirely satisfactory alone, although collectively they could make up an effective system. Unfortunately, there are few places where the proper mix is both available and utilized. NACOA strongly urges NOAA to undertake the design and evaluation of pilot projects to determine and rank the various alternative systems for this purpose.

In addition to recommending that NOAA undertake the responsibility for making certain that warning messages are not only sent but are also delivered to someone who can take action, NACOA recommends that NOAA, in conjunction with appropriate action agencies, develop a moni-

* "The Agnes Floods, a Post-Audit of the Effectiveness of the Storm and Flood Warning System of the National Oceanic and Atmospheric Administration. A Report for the Administrator of NOAA." NACOA, GPO, Washington, D.C., Nov. 22, 1972.

** *Op. cit.* p. 2.

toring component of the disaster warning system to sense public response to the warnings and modify it in the light of public response.

Turning to the internal functioning of the National Weather Service, also discussed in detail in the Report of the Agnes Panel, we believe great improvement is possible by accelerating the application of existing communications and automation technology and procedures by NOAA. Furthermore, this capability is necessary to improved warning delivery. The two go hand-in-hand.

The exciting prospects which can now be provided by modern technology can be seen in the concept for the Automation of Field Operations and Services (AFOS). Its objective is to bring about maximum automation of the myriad of routine tasks now done manually.

In general, much of the technology applied today in the field services of the NWS is of pre-World War II vintage. It is true that weather radar is in widespread use, and that the radar data are increasingly distributed by slow-scan facsimile. It is also true that the observer is assisted by such modern weather observing instrumentation as ceilometers and transmissometers, but he still reads dials, records his observation in his own handwriting, and often cuts his own paper tape for transmission over teletype circuits. It is true that the forecaster has access to the output from sophisticated numerical weather prediction models run on some of the world's most powerful computers. But, to find whether rain has fallen in the next State in the last three hours, he may have to sort through many feet of teletype paper. The impact of significant advances in atmospheric sciences, and in exciting new observing techniques, such as the use of satellites, is dulled by the limitations imposed by the use of outmoded data handling and communications techniques. This is in spite of revolutionary advances in the state of the art in information handling and communications.

Perhaps the most striking paradox in the National Weather Service operations today can be seen by comparing its National Meteorological Center (NMC) with some aspects of its field operations. NMC is at the forefront in applying the science of meteorology and numerical techniques to day-to-day forecasting problems. In doing so, it is also pushing the state of the art in large-scale computer systems. As a direct result, the computer-generated 48-hour forecasts produced today have roughly the same validity or are just as useful as the 24-hour forecasts that were produced only a few years ago. On the other hand, in many of its field operations, surface observations are taken and recorded manually even though remarkable strides have been made in development of automatic weather stations.

The heart of the field portion of the proposed AFOS concept is the minicomputer and TV display equipped Weather Service Forecast Office (WSFO). The computer and display system will support the WSFO fore-

caster directly by performing other data handling functions such as automatic monitoring of forecasts and automatically alerting the forecaster when predetermined criteria are met which require his attention.

The same system can automatically collect observations from those automatic and manual surface stations, radar stations, and upper air stations within the WSFO's area of responsibility. In addition, the minicomputer system will automatically disseminate forecasts and warnings to Weather Service Offices, radio, television, newspapers, police, schools and other local users.

All WSFO's will be interconnected to each other and to the various National Centers (such as the National Hurricane Center), and the River Forecast Centers. This interconnection will be made via a National Digital Circuit in such a way that observations and processed data such as satellite images, forecasts, and computer products are available anywhere in the system.

With such a system, the forecaster can quickly be made aware of developing severe weather or a flood situation. He will have all the supporting observations, National Meteorological Center products, National Hurricane Center products, and National Severe Storm Forecast Service products in electronic storage for immediate display. He can call up from storage predesigned warning message formats onto a TV display that he need only complete. With the press of a button, the warning can automatically be on its way.

The end result will be the automation of routine data handling, manipulation, and communications tasks. Exceptional events can be automatically called to the forecaster's attention. All this will free the man in the system from many routine tasks and permit him to do those things that require judgment and creativity. For example, with the situation as it exists today, it is very difficult for a small plane pilot to reach a forecaster who could brief him when he plans his flight. This represents a special requirement for forecast products. It is similar, though more crucial to safety, to the special requirement that a farmer might have for a weather forecast in making a decision about when to cut hay. There are many others. NACOA feels that there is much weather information that exists today within the National Weather Service that is not readily available to many groups of potential users who have special requirements.

We support the efforts of the NWS to automate routine functions and to free the forecaster for contact with users. NACOA strongly supports the preparatory steps already taken by NOAA to automate the system and urges that the implementation of these programs be given priority support. As these improvements are made, careful interagency coordination between NOAA, DOD, and the FAA should continue so as to guarantee that inter-

system compatibility continues, and that the quantity and quality of the observations and services are maintained.

Weather Modification and Control

Last year NACOA noted that we stand on the threshold of a new era of environmental control. We also emphasized that the field needs a balanced approach on several fronts. Public policy issues with both domestic and international ramifications are intensifying. Legislation, as well as studies of social and economic impacts, are needed. Further, the relatively modest funds allocated to research need to be focused to permit the program to move ahead in a coordinated fashion.

As we pointed out last year, weather modification within the Federal Government is carried out by seven agencies to meet their mission needs. The Departments of Agriculture, Interior, Transportation, and Commerce are all concerned with weather modification possibilities related to their responsibilities such as: precipitation and water resources management; reduction of damage from hail, lightning, and violent storms; abatement of hurricane intensity; and improvement of the capability to use airports where visibility is reduced by fog. What NACOA found lacking is a central strategy for the overall research effort. There is a common dependence on increased theoretical understanding of the processes involved, which is in turn dependent on accurate measurements, improved instrumentation, facilities for experimentation, computer simulation, and the ability to mount and manage large-scale field experiments. We had recommended increasing the NOAA lead role because it possessed the bulk of the capabilities required. We regret to note that this has not taken place, and further, that a step has been taken in the opposite direction—the assignment of lead responsibility for precipitation enhancement was transferred from NOAA in Commerce to the Bureau of Reclamation in Interior. Further, the budget was cut in half at the same time. It is important to note that precipitation enhancement is not ready for general operational use, and will not be, without much greater effort in research.

To elaborate, there is a common thread that winds through all the weather modification objectives that are supported by the various Federal agencies. This thread is the importance of understanding the fundamental physical processes involved. The traditional heavy reliance on statistical inference from experiments, where only the gross features of the phenomena could be observed, has carried the field forward to where it is today. Now, however, it is time to probe more deeply into the machinery of these phenomena if we are to go from modification to control.

For this reason, NACOA is concerned with the decline of the overall research effort in atmospheric and cloud physics. The resource levels which support basic laboratory and field work in cloud physics have declined to

the point where the small cadre of experts built up over the last twenty years is in danger of being dispersed. There is a danger that the funding authorities, in their quite proper zeal for practical results, will underestimate and undervalue the still extensive research that must precede reliable operational use.

At the same time a national research strategy must be guided in selecting priorities for its research effort by the prospects for practical payoff. These prospects have two dimensions: first, the "ripeness" or time to payoff; second, the importance of the payoff. Time to payoff involves primarily scientific judgment. The importance of the payoff in practical terms, however, involves a great variety of considerations regarding costs and benefits of all the alternatives, with weather modification being only one.

Two recent studies, still in prepublication form, have come to our attention. One is, "Weather Modification in the Public Interest," by R. G. Fleagle, J. A. Crutchfield, R. W. Johnson and M. F. Abdo at the University of Washington. The study undertakes to appraise the steps taken so far in developing the capability to modify weather, to identify critical issues which limit development or which influence the ability to direct weather modification in a socially responsible manner, to consider a means for rational systematic examination of weather modification programs, and to develop a policy for its implementation.

The study is concluded with a set of recommendations to insure the effective development and utilization of the capabilities of weather modification for socially beneficial goals. Among the actions recommended is the designation of NOAA as the lead agency in coordinating Federal weather modification activities and for managing a research program addressed to the critical scientific problems; the passage of legislation designating the Administrator of NOAA as the responsible official for decisions regarding weather modification activities that are directly related to the saving of lives or to other critical aspects of the national welfare; and the establishment of an institute which would conduct objective and thorough studies of policy alternatives and the impacts of weather modification activities. NACOA made similar recommendations in its first Annual Report last year.

The other study is a report by the Panel on Weather and Climate Modification of the Committee on Atmospheric Sciences, NAS/NRC entitled "Weather and Climate Modification: Problems and Progress." Three major goals proposed are:

- Identification, by the year 1980, of the conditions under which precipitation can be increased, decreased and redistributed in various climatological areas through the addition of artificial ice and condensation nuclei.
- Development in the next decade of technology directed toward miti-

gating the effects of the following weather hazards: hurricanes, hail storms, fog, and lightning.

- Establishment of a coordinated national and international system for investigating the inadverent effects of manmade pollutants, with a target date of 1980 for the determination of the extent, trend, and magnitude of the effect of various crucial pollutants on local weather conditions and on the climate of the world. (NACOA wishes to point out that a relatively new candidate as a major pollutant for inclusion in the third goal is waste heat. Projected trends indicate this could be an observable factor in the general circulation of the atmosphere by the year 2000.)

NACOA supports these goals and believes that specific sets of research projects can and should be defined to insure their accomplishment.

We believe that NOAA should take the lead in developing and coordinating the implementation of such a program. Although the track record of the Interdepartmental Committee of Atmospheric Sciences (ICAS) is generally excellent, and ICAS should prove of value in this program as well, the dispersive forces serving to fragment the program are strong. We feel that a formal lead agency assignment is desirable and that NOAA is the appropriate candidate.

We believe also that the details of this program should be guided by a series of "requirement" analyses and that the appropriate mission agencies, such as Interior, Agriculture, etc., have a vital role to play.

Finally, as capabilities approach the stage of operational readiness, a systematic assessment should be required for approval of candidate operations. We suggest that mission agencies develop the capability to generate plans which provide cost and schedule estimates for the acquisition, implementation, and operation of weather modification systems. These plans should:

- show that the technology needed is sufficiently in hand—that primarily engineering rather than experimental effort is required;
- show that the mission and performance envelopes are defined;
- show that the best technical approaches are planned for utilization;
- show that trade-off analyses have been made to demonstrate that the proposed operational program is cost-effective in comparison with other techniques that could be used to satisfy the need;
- show that cost and schedule estimates are credible and acceptable; and
- show that legal, social, economic, and environmental impacts have been assessed.

Operational weather modification programs which can be depended upon to be effective in mitigating the effects of large-scale weather generated disasters are not in hand. Major technological problems still remain.

The search for solutions to these problems will require the design and accomplishment of extensive field tests, the execution of laboratory experiments, the development and test of complex numerical models, etc. Solutions to the many legal, social, moral, and economic problems associated with increased technological capability in weather modification will have to keep pace. In view of the anticipated difficulties, both technical and otherwise, and recalling our earlier discussion of the problem of providing adequate disaster warning, we again recommend that attention be given to providing incentives for the reduction of hazards through controlled use of areas susceptible to flooding by rivers and inundation by high tides associated with coastal storms and hurricanes. In the long term, the most effective measures of all may be preventive and protective measures for reducing vulnerability.

Fisheries Activities

NACOA finds two recent Government actions—the pending High Seas Fisheries Bills and the State/Federal Management Program of the Fisheries Service—welcome progress in laying the necessary groundwork for the species approach to the management of the coastal fisheries. However, NACOA does not feel that some progress is enough progress. Without a national planning effort such as that recommended last year, it will not be possible to allocate effort where it does the most good. Overview planning is therefore again discussed. In addition, NACOA emphasizes the need for economic regulation and uniform national and international enforcement, without which conservation or utilization plans could never be made effective.

Introduction

The predicament of the U.S. commercial fisheries remains acute. The trend which saw the U.S.-supplied share of the fishery products the Nation consumes drop in less than twenty years from about 70 percent in 1955 to about 35 percent in 1972 shows no sign of being reversed. If this continues, the pursuit, in the United States, of this ancient calling could be weakened beyond recovery.

The tangle of fisheries problems shows little sign of easing although at least two important positive Government actions, now underway and consistent with a national approach compatible with localized capabilities can only have a beneficial effect. The first is consideration of legislation such as the High Seas Fisheries Bills, HR 4760 and S 1069. The second is the start, even if slowly, of the National Marine Fisheries Service (NMFS) State/Federal Management Program.

These two actions are interrelated. The High Seas Fisheries Bills would provide a broad Federal authority on the basis of which actions *may* be taken. The NMFS State/Federal Program would help select the actions which *ought* to be taken.

In more detail: HR 4760 and S 1069 provide for Federal conservation

and management authority to regulate U.S. vessels when they are fishing beyond the 3-mile limit of the territorial sea. This would smooth differences between States by bringing pressure to bear for them to adjust variations in existing State law or practice by authorizing, in a manner which complements appropriate State fishery laws and regulations, consistent Federal regulations over all vessels in the 3- to 12-mile contiguous zone. The bills also provide the specific authority to the United States to carry out its obligations under international fishery agreements beyond the 12-mile limit which covers all U.S. vessels (or foreign vessels when covered by international agreement) on the high seas in the zone of agreement. This sets up the statutory authority for coastal fishery management by species rather than by geography.

The State/Federal Management Program of the NMFS is an important tool by which this management possibility can be put into sensible practice. Agreements for good fisheries management practice among all States involved in a specific fishery are being formed under this Program species by species. What is being sought is general understanding of the States' varying histories, practices, interests, and regulations to allow them to adjust to each other's differing needs in a visibly equitable fashion. The Program does this by bringing together as a planning body, technical representatives (biologists, economists, etc.) from each of the States involved in a given fishery. This body formulates a fishery management plan which is checked with various of the interested parties such as commercial and sports fishermen, conservationists, etc. The plan is then passed on to a policy or action board composed mostly of Directors of the State Fisheries Services. They, in turn, work the plan and get that which is agreed upon back to their respective State Legislatures for action.

This is a long haul. Furthermore, interactions among species, which are not well understood, could be very significant. At present the lobster fishery and northern shrimp management plans are close to the end point although several other species are in earlier stages of the procedure. An agreed lobster plan is back with the 11 State Legislatures involved in the fishery for individual enactments. It could be several years before it goes into effect. The northern shrimp plan which involves only three States, awaits some factfinding on the resource, but should be in effect sooner. Even so, successful application to inshore fisheries does not do it for the offshore, international fisheries.

Therefore, while the pending legislation, if passed, and the State/Federal Management Plan which is only now underway,* are good beginnings, they are only beginnings.

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* This office has been in being for a little over a year. Support for it is such that it is one of the two programs in the NMFS (the other having to do with mammal protection) which has been given an increase in the FY '74 budget request.

Where is the National Plan?

The big question for NACOA is whether *some* progress is enough progress. On this score we are less optimistic because the solutions do not seem to be gaining on the problems. We believe the general situation of the U.S. fisheries will not be reversed until the NMFS can get a handle on how much effort must be put where, by whom, *and by when.* NACOA sees little evidence of a national planning effort for U.S. fisheries which would give assurance that priority is given the most critical issues—a far more complicated question than the choice of the most important species because it involves internal and international economic and legal questions.

The key recommendation of the NACOA Report in Fisheries last year was that a national planning effort for U.S. fisheries is necessary if the U.S. fishing industry is to better its place amongst the fishing nations of the world in the face of a tightening oceanwide race for the resource. Similar efforts at developing a coordinated strategy have been suggested before. They have not taken hold, perhaps because the approach to fisheries problems has been built on response to local or specialized needs. Such efforts are piecemeal. A larger view is needed. We will therefore go into a little more detail about the reasoning NACOA used in arriving at its recommendation for a planning effort and perhaps, in that way, help get things started.

Finding the Range

Our national position on fisheries is not independent of our international position and discussion of a national plan should therefore be reviewed against the backdrop of the stand on fisheries taken by the United States in preparation for the Law of the Sea Conference in 1974. We quote last year's succinct statement on this.

> The U.S. position with respect to the fisheries question has been slow in formulation because of the lack of an agreed industrywide position. Now, however, the industry as a whole has agreed to support the position prepared by the U.S. Working Group. The coalition of interest has been largely induced by the realization that the current worldwide fishing capability can grossly reduce the catch of currently marketable fish and alter the relative species balance in a major way if uncontrolled and unregulated. The position proposed is to assign each coastal fishery to the adjacent state for management and licensing: to assign responsibility for anadromous fish to the country in whose waters the fish spawn; and to rely on multilateral arrangements for the pelagic fisheries. *The basic approach is to place priority on conservation of the resource.* This approach, in the case of the coastal fishery, has the important corollary that the fixed territorial concept is removed from the important fisheries domain, and should help relieve the pressures which appear to be driving territorial limits outward.*

* "First Annual Report to the President and the Congress by NACOA," GPO, Washington, D.C., June 30, 1972, p. 7.

Three essential features stand out: (1) general recognition that the threat to the resource is not the local problem of a particular fishery or a particular section of the country; (2) priority to conservation of the resource; and (3) the "species approach" in which management using sound biological and economic principles, rather than geographical considerations, should govern, with preferential access for the nation off whose coasts the fisheries lie. To this we would now add emphasis on national and international enforcement of fisheries agreements.

It should be noted that, though the U.S. position on "species approach" hasn't changed, estimates of the chances for effective international agreement at the Law of the Sea Conference have seldom been very optimistic. But whatever does happen, *some* arrangement for greater control by the coastal nations over the fish stocks off their shores for the purpose of both management and of harvest seems likely and should be anticipated. The United States must start planning now to be in a position to take advantage of such preferential access or some similar arrangement if and when it is worked out—preferably with, but if necessary without, international support. The United States must protect its coastal and anadromous resources from overfishing.

What these first planning steps should be is not common ground. Despite general agreement on the necessity for a national approach as given in the last Annual Report, NACOA could report no consensus on where to begin. But suggestions to emphasize correction of jurisdictional problems, inventory the assets, and regulate or limit entry so as to control the fishing effort predominated. It was clear to NACOA that all of these aspects had to be worked on at the same time. This is what makes it so complicated. If essential agreement on what to do first is needed before action is taken, and if there is no clear consensus on what to do first, it may be necessary to make the several approaches at the same time, not in series. Otherwise every possible solution is torpedoed by the unanswerable questions about "other" aspects of the complicated fishery problem.

That is why, last year, NACOA suggested setting a provisional planning target for an increased share of the domestic market to be supplied by domestic fishermen. We may have created some misunderstanding by not making it explicit that the goal (50 percent of the domestic market to be supplied by the domestic fishing industry by 1980 as opposed to the current share of 40 percent)* was a suggested target intended to uncover problems and obstacles standing in the way of achieving any reasonable goal. If this target turned out to be unrealistic, why then it would have to be changed. If the assumptions, either about the supply or about the de-

* The increase in share of the market of 10 percent coupled with market growth at the rate of the last three decades, implied an increase of 40 percent in fish supplied.

mand, turned out to be unsupportable for 1980, once again the target would have to be changed. And so on.

NACOA reaffirms the desirability of setting such a market target with due regard for the practical limits on any individual species, and then working backwards to see what would be required of U.S. science and industry to supply that market, and what else in the way of legislation or government programs would have to be done to make these requirements achievable. Setting a target is simply a way of looking at it all together. If a gap shows up between what is aimed for and what one can expect, it might indicate increased emphasis on aquaculture, or the desirability of changing the requirements for fishing-vessel construction, or the need for limiting entry in some fisheries, or the need to emphasize certain problems for research, or for working at reducing social costs, etc. One cannot go at this fishery by fishery. Each has to be looked at nationally and all at the same time.

Planning, Regulation, and Enforcement

In any brief exposition of an approach to a complicated problem, emphasis on certain fundamental steps should not be taken as disregard for other, perhaps equally critical steps, which will have to be taken later on. NACOA is aware that a target is not a plan, and a plan is not action. The course of action, which will have to be worked out in detail, must be worked out against a general understanding of the importance of fisheries to the United States and with due regard for the interaction between economic, biologic, legal, and market problems. NACOA maintains its belief that, given some assurance of the continued availability of the resource, and assurance of the right to fish for a specified tonnage, individual enterprise would find an attractive economic environment had been created because uncertainties would then be limited to the normal risks of doing business. But an "atmosphere for redevelopment" means only that there is a chance to succeed, it does not mean that success is guaranteed. To provide that chance, the steps have to be taken with due regard for the following six conditions:

- Fisheries, as part of the national wealth, are a resource which we must husband.
- Conservation by agreement, by regulation, and by uniform national and international enforcement, is a necessary consequence of this regard.
- Jurisdictional problems, while among the most difficult to solve, are nonetheless susceptible to attack because they lie among the issues which can be resolved by patience, facts, and negotiation.
- Conservation is not realistically achievable by biological management

considerations alone. The Federal Government must also work out an approach to economic regulation of the industry with due regard for historic rights and social consequences. NACOA believes that unless there is a limit to fishing effort, the inherent surge to overcapitalization in any successful fishery will soon make it marginal. Restoration of fisheries already marginal can be brought about only by such means.

- Protection for the coastal and high seas fisherman needs higher priority than heretofore given. This is less a question of force than it is of enforcement. Differential enforcement of fisheries regulation on our own fishermen is neither fair nor ultimately successful in conserving the fishery. This implies stronger effort to achieve international enforcement of sound fishery management rules.
- Subsidized capital loans and technical assistance to developing countries should henceforth be conditioned on their compliance with international agreements on enforcement of conservation and fisheries rights.

Enforcement is no easy matter. Its requirements run the gamut in delicacy from the scalpel to the jackhammer. Enforcement should be concerned with economic regulation and conservation measures rather than be dominated by political considerations. In each category U.S. and foreign nationals are involved. Amongst foreign nationals there are those signatory to a pact, those signatory but not granting rights of reciprocal inspection, and those not signatory. However, the simple fact emerges that while the United States is in a good position to enforce sensible conservation rules on its own nationals, it cannot easily and uniformly enforce them on foreign fishermen. It naturally outrages those U.S. fishermen, who, while agreeable to abiding by conservation regulations, also want to make a living in a market where not all the competitors are forced to abide by the same rules.

There is thus a tug of war between those pressing for unilateral action in a fishery where the competition is distorted by differential enforcement, and those who cannot see the United States do other than abide by the rule of international law even when it puts some at a disadvantage. It may be that the physical surveillance and enforcement capabilities of the United States (satellite observation matched to the radio reporting of position in the case of tuna convention enforcement, for example) can be offered to other signatories so that enforcement could be more equitably distributed. This is clearly a complicated question and the circumstances vary from fishery to fishery both in nature and in emotional and economic impact. As a principle, NACOA espouses improving general enforcement on all concerned rather than in falling back where we are ahead of the field. But NACOA realizes that the men on the line may have neither the

economic reserve nor the patience to wait indefinitely. These matters must be pressed with more urgency than has been true in the past.

Proper enforcement is one of the keys to conservation of the world resource. It becomes less problematical as recognition grows of the danger to the resource. On the national stage this time has apparently come. We must press for it ocean-wide.

Pace and Direction

NACOA strongly recommends:

(1) Passage of the High Seas Fisheries Bills such as HR 4760 and S 1069 which would assist both Federal and international good fisheries management.

(2) Development of a national plan by the Secretaries of Commerce and Interior for the use of the national fishery resources.

(3) International agreements incorporating mechanisms for the conservation of stocks upon which United States fishermen depend, and greater awareness of the problem of international enforcement.

(4) Continued support of the species approach in the coming Law of the Sea Conference.

What NACOA finds lacking is pace, more than direction. Some of the right things are being done, but only some and not quickly enough. Coastal matters are being worked out, but only at a snail's pace. International matters are being worked out, but as if avoidance of conflict were itself a victory. Meanwhile the fish stocks slip, the young men go into other work, and as a Nation we import most of the fish we eat. What we do have to find out is whether we will or will not do something about it.

Appendix I

Public Law 92-125
92nd Congress, H. R. 2587
August 16, 1971

An Act

85 STAT. 344

To establish the National Advisory Committee on the Oceans and Atmosphere.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, There is hereby established a committee of twenty-five members to be known as the National Advisory Committee on Oceans and Atmosphere (hereafter referred to in this Act as the "Advisory Committee").

National Advisory Committee on Oceans and Atmosphere. Establishment.

SEC. 2. (a) The members of the Advisory Committee, who may not be full-time officers or employees of the United States, shall be appointed by the President and shall be drawn from State and local government, industry, science, and other appropriate areas.

(b) Except as provided in subsections (c) and (d), members shall be appointed for terms of three years.

(c) Of the members first appointed, as designated by the President at the time of appointment—

(1) nine shall be appointed for a term of one year,
(2) eight shall be appointed for a term of two years, and
(3) eight shall be appointed for a term of three years.

(d) Any member appointed to fill a vacancy occurring prior to the expiration of the term for which his predecessor was appointed shall be appointed only for the remainder of such term. A member may serve after the expiration of his term until his successor has taken office.

(e) The President shall designate one of the members of the Advisory Committee as the Chairman and one of the members as the Vice Chairman. The Vice Chairman shall act as Chairman in the absence or incapacity of, or in the event of a vacancy in the office of, the Chairman.

Chairman and Vice Chairman

SEC. 3. Each department and agency of the Federal Government concerned with marine and atmospheric matters shall designate a senior policy official to participate as observer in the work of the Advisory Committee and to offer necessary assistance.

Senior policy official.

SEC. 4. The Advisory Committee shall (1) undertake a continuing review of the progress of the marine and atmospheric science and service programs of the United States, and (2) advise the Secretary of Commerce with respect to the carrying out of the purposes of the National Oceanic and Atmospheric Administration. The Advisory Committee shall submit a comprehensive annual report to the President and to the Congress setting forth an overall assessment of the status of the Nation's marine and atmospheric activities and shall submit such other reports as may from time to time be requested by the President. Each such report shall be submitted to the Secretary of Commerce who shall, within 90 days after receipt thereof, transmit copies to the President and to the Congress, with his comments and recommendations. The comprehensive annual report required herein shall be submitted on or before June 30 of each year, beginning June 30, 1972.

Duties.

Reports to President and Congress.

SEC. 5. Members of the Advisory Committee shall, while serving on business of the Committee, be entitled to receive compensation at rates not to exceed $100 per diem, including traveltime, and while so serving away from their homes or regular places of business they may be allowed travel expenses, including per diem in lieu of subsistence, in the same manner as the expenses authorized by section 5703(b) of title 5, United States Code, for persons in Government service employed intermittently.

Pay.

80 Stat. 499.

SEC. 6. The Secretary of Commerce shall make available to the Advisory Committee such staff, information, personnel and administrative services and assistance as it may reasonably require to carry out its activities. The Advisory Committee is authorized to request from any department, agency, or independent instrumentality of the Federal Government any information and assistance it deems necessary to carry out its functions under this Act; and each such department, agency, and instrumentality is authorized to cooperate with the Advisory Committee and, to the extent permitted by law, to furnish such information and assistance to the Advisory Committee upon request made by its Chairman, without reimbursement for such services and assistance.

Department of Commerce and other agencies, assistance.

SEC. 7. There is hereby authorized to be appropriated to the Secretary of Commerce $200,000 for the fiscal year ending June 30, 1972, and each succeeding fiscal year to carry out the purposes of this Act.

Appropriation.

Approved August 16, 1971.

LEGISLATIVE HISTORY:

HOUSE REPORT No. 92-201 (Comm. on Merchant Marine and Fisheries).
SENATE REPORT No. 92-333 (Comm. on Commerce).
CONGRESSIONAL RECORD, Vol. 117 (1971):
May 17, considered and passed House.
Aug. 2, considered and passed Senate, amended.
Aug. 5, House concurred in Senate amendments.

Public Law 92-567
92nd Congress, H. R. 15280
October 25, 1972

An Act

86 STAT. 1181

To amend the Act of August 16, 1971, which established the National Advisory Committee on Oceans and Atmosphere, to increase the appropriation authorization thereunder.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section 7 of the Act of August 16, 1971 (Public Law 92-125; 85 Stat. 344), is amended to read as follows: "There are hereby authorized to be appropriated to the Secretary of Commerce, for the fiscal year ending June 30, 1973, and for each of the two fiscal years immediately thereafter, such sums, not to exceed $400,000, as may be necessary for expenses incident to the administration of this Act, and for succeeding fiscal years only such sums as may be authorized by law.".

National Advisory Committee on Oceans and Atmosphere. Appropriation, authorization, increase. 33 USC 857-12.

Approved October 25, 1972.

LEGISLATIVE HISTORY:

HOUSE REPORT No. 92-1467 (Comm. on Merchant Marine and Fisheries).
CONGRESSIONAL RECORD, Vol. 118 (1972):
Oct. 11, considered and passed House.
Oct. 13, considered and passed Senate.
WEEKLY COMPILATION OF PRESIDENTIAL DOCUMENTS, Vol. 8, No. 44:
Oct. 28, Presidential statement.

THE SECRETARY OF COMMERCE
Washington, D.C. 20230

August 15, 1973

The President
President of the Senate
Speaker of the House of Representatives

Sirs:

I have the honor to submit, in accordance with Public Law 92-125, August 16, 1971, the Second Annual Report of the National Advisory Committee on Oceans and Atmosphere (NACOA).

Enclosed also are my comments and recommendations which are required by the Act.

Respectfully,

Secretary of Commerce

Enclosures

COMMENTS AND RECOMMENDATIONS OF THE SECRETARY OF COMMERCE ON THE SECOND ANNUAL REPORT OF THE NATIONAL ADVISORY COMMITTEE ON OCEANS AND ATMOSPHERE

PREFACE

I have reveiwed the Second Annual Report of the National Advisory Committe on Oceans and Atmosphere (NACOA) and have consulted with the other interested agencies of the Federal Government. I wish to express my appreciation to the Committee for its appraisal of some of the key problems in the Nation's oceanic and atmospheric effort.

The Committee has focused on major issues requiring early attention by both the Executive and the Congress. While the views expressed by the Committee diverge in some respects from courses of action already underway or planned by the Administration, I find the goals which the Committee seeks to achieve in general agreement with those of the Administration. Many of the Committee's specific recommendations are now being implemented. Some will be studied further. However, all of the views and recommendations of the Committee will receive serious consideration.

To facilitate the comparison of my comments with the recommendations of NACOA, I have organized them in accordance with the chapters of the Committee report. In these comments I will seek to place in perspective the Administration views of the issue raised by the Committee.

INTRODUCTION

The Committee has made a major point in its introduction of the impact of the curtailment of Federal spending during fiscal years 1973 and 1974. That there have been significant impacts upon the Nation's oceanic and atmospheric programs is undeniable. The

President has indicated repeatedly the overriding national need for holding Federal spending in check to minimize inflationary pressures from Government spending. Actions now pending before Congress indicate similar Congressional concern for this national objective. Some of the actions to reduce spending in oceanic and atmospheric activities in the several agencies were taken with reluctance, in recognition that there would be some adverse effects; others because programs had been rendered inefficient by the advent of replacement technologies. I do not believe that any programs of overriding national importance have been sacrificed. However, the concerns of NACOA are noted, and those pinpointed will be reviewed to determine whether some restoration should be made in fiscal year 1975 and beyond.

The Committee's concern about the adequacy of the oceanographic fleet to meet the national needs and its more general concern about the adequacy of the capital structure for all marine and atmospheric sciences warrants investigation. In the case of the oceanographic fleet, it appears that the reduction will be less than 18 percent as contrasted with the 25 percent cited by the Committee. However, the capital structure problem is of sufficient importance to warrant a special study, and I have asked the Chairman of the Federal Council for Science and Technology to undertake this study through the appropriate interagency committees.

NATURAL RESOURCES AND MARINE AFFAIRS

The Committee's view is that the management of land, water and atmospheric resources is so closely related that they should be organized into a single Federal agency at the departmental level. The President's proposal for establishment of a new Department of Energy and Natural Resources (DENR), which will achieve this end, is now before Congress. The Committee's rationale coincides with that of the President.

The approval by the Congress of the President's proposal will, among other effects, bring about the loss of the National Oceanic and Atmospheric Administration (NOAA) to the Department of Commerce. I have grown to have a deep appreciation for oceanic and atmospheric activities during my tenure as Secretary of Commerce. It is, therefore, with some sadness that I view the prospect. However, I believe it is in the national interest that the President's proposal be quickly endorsed by the Congress and that the DENR

be brought swiftly into being. We need management mechanisms that will allow us to deal more effectively with our overall energy and natural resource problems, and we need them now. NOAA will be an essential element of the new Department.

While the Committee's endorsement of the President's proposals is basic and overriding, it is concerned with what it sees as the lack of attention given to the role of the oceans in the proposal for the DENR. I wish to assure the Committee and the Congress that the Administration attaches great importance to oceanic and atmospheric affairs. In recognition of this, President Nixon has proposed that ocean, atmosphere and earth science and service activities be organized into one of the five major elements of the new DENR.

The Committee has also provided suggestions for possible organizational alignments within the new DENR. Organizational structures and their functions lend themselves to an infinite variety of permutations as pointed out by the Committee. The President's proposal does not include transfer of such major organizations as the Coast Guard from the Department of Transportation or the Maritime Administration from the Department of Commerce, etc., to the new DENR. While recognizing that these organizations are involved in oceanic functions, the Administration believes that the adverse impact on the Nation's transportation, safety, and commerce functions would outweigh the benefits to be derived from their consolidation within an "oceanic" organization. Similarly the advantages of the Committee's proposals to separate the Maritime Administration from its research and development functions and to split up both the National Marine Fisheries Service and the Bureau of Sport Fisheries and Wildlife would be outweighed by the inability of these organizations to provide responsive foci for their areas of activity.

It is the intention of the Administration to join NOAA and the U. S. Geological Survey (USGS) within DENR. Enormous benefits and new strength will be added to the oceanic and atmospheric functions of NOAA and the earth functions of the USGS. At some later date, additional functions can be considered. At that time, the suggestions of NACOA will be given further consideration.

The Committee has recommended the designation of an appropriate official of the Navy, such as the Oceanographer of the Navy, as Federal Coordinator for marine technology development. I strongly support the need for Federal coordination in all areas of governmental activity where many agencies are involved. In the

case of marine technology, however, we already have a mechanism within the Federal Council for Science and Technology, namely, the Interagency Committee on Marine Science and Engineering (ICMSE) which is dealing with this problem and on which the Navy and other agencies are represented. The outstanding capability of the Navy in ocean engineering has been and will continue to be of great value to the Nation's civil ocean engineering programs, and this use should be more extensively encouraged.

The concern of the Committee for the national effort in ocean engineering is appreciated. I agree that ocean engineering is a key to broad scale ocean development. One of the more difficult questions, however, is the extent to which the Federal Government should engage in and support civil ocean engineering activities. I believe that the Committee could provide help in the formation of the Nation's ocean engineering effort by undertaking a comprehensive study of the national needs and the appropriate role of the Federal Government in meeting them. I have asked the Chairman of NACOA to undertake such a study.

ENERGY AND THE OCEANS

I have studied with great interest the Committee's views on energy and the oceans and the vital role of the oceans in meeting the energy needs of the Nation.

The Committee correctly points out that the most promising way to increase our domestic discovery rate for oil and gas is to intensify exploration and drilling offshore on the continental margins of the United States. The President has recognized this imperative in his recent energy message in which he directed that the rate of leasing of offshore lands be tripled. A leasing schedule designed to fulfill this directive has been issued.

The problem of safeguarding the environment while developing the Nation's offshore oil and gas resources is a major concern of the Administration. I agree fully that there is no basic inconsistency in developing the Nation's oil and gas resources while retaining a quality environment. The technology needed to accomplish this objective is under development and for many purposes already available. In meeting our energy needs, we must continue to insure that the necessary scientific and environmental knowledge is available so that decisions can be made with all factors known. The Committee points out that one of the top priority Government

functions must be to establish the environmental norms and the environmental support services for the necessary oil exploration offshore. Such environmental services must include forecasts of weather and sea states and ocean currents, as well as provision of biological background information which can be used for making assessments of oil contamination. The Committee feels that these activities must be accompanied by periodic monitoring. I agree that this is a proper role for the Federal Government. We intend to provide the necessary ocean monitoring and ocean forecasting support.

The President has directed that, under the leadership of the Council for Environmental Quality, a comprehensive environmental study be undertaken of the possible impacts of oil and gas development along the Atlantic and Alaskan coasts. This study will be completed in April 1974. In addition, the President has forwarded legislation to the Congress providing for the certification of the environmental safety of deep-water ports. This should insure that our environmental objectives are not compromised in the process of meeting our energy needs.

One of the most interesting aspects of the Committee report is its assessment of the national need for deep-water terminals and deep-water ports. Without question, as the national dependence upon foreign crude oil increases, the United States will need facilities to accommodate tanker traffic, traffic that will involve ships of massive size, up to 500,000 dead-weight tons. Studies, sponsored by various agencies of the Federal Government including the Maritime Administration, are underway on issues such as those raised by the Committee report. In addition, the Administration has proposed legislation (S-1751, H.R. 7501, Deep-Water Port Facilities Act of 1973) to authorize the Secretary of the Interior to regulate the construction and operation of deep-water port facilities.

The Committee has also stated its concern about the difficulty in obtaining approval of sites which satisfy economic and environmental criteria for the construction of major new refineries. While it is true that environmental concerns may have deterred some companies, it is noteworthy that since the removal of crude oil import restrictions on May 1, 1973, several oil companies have decided to expand existing refinery capacity. This expansion will provide a total increase of 10 percent in our national capacity. However, the issue raised by the Committee is a crucial one. It involves the manner in which we balance our economic and en-

vironmental needs. My view is that we must insure a balanced approach to this problem. It is a topic on which the advice of the Committee is most welcome.

Similarly, the Committee has discussed the problem of siting new major power plants. The Administration believes that this is also a critical matter. It has proposed legislation (S-935, H.R. 4874, Electric Facilities Siting Act of 1973) which will provide long-range regional planning for bulk power facilities within Federal guidelines. The purpose of the legislation is to meet national power needs while reasonably protecting the environment, conserving natural resources, and planning the proper use of available land. This legislation will provide decision-making agencies with procedures for achieving a publicly acceptable balance of these competing objectives.

The siting of nuclear power plants on bays and tidal rivers is a special problem. There is a need to minimize thermal pollution. Such thermal pollution is more readily accommodated in deeper water than it is in the shallow and biologically sensitive estuarine and near-shore area. I feel, therefore, that the Committee's recommendation for new approaches to coastal siting, particularly the possibility of offshore siting of nuclear plants, warrants serious consideration.

MANAGING THE COASTAL ZONE

NACOA expressed concern about the delay in funding the Coastal Zone Management Act, passed by the last Congress, and signed by the President into law as Public Law 92-583. Since the delivery of the report to me, the Administration announced on 1 August that an amendment to the President's fiscal year 1974 budget would be submitted to fund the Coastal Zone Management Act. This has been done. Five million dollars have been requested to implement the provisions of the Act.

The Administration has always regarded the management of the coastal zone as being a matter of great importance. It had felt, however, that a period of more extensive planning was required before funding of the coastal zone management activities could take place. It has started to work with all of the coastal states and has now issued, in draft form, guidelines for the development of coastal zone management programs. These were published in the *Federal Register* on June 13, 1973.

In a related action the Administration sent to the Congress its proposals for a national Land-Use Policy Act. One of the concerns of the Administration is that efforts to manage the coastal zone are compatible with more general land-use management activities. Favorable action by the Congress on a Land-Use Policy Act is vital for concurrent implementation of both of these programs. The formation of the proposed DENR will enable the establishment of closely coordinated programs for both land and coastal zone management.

ATMOSPHERIC ACTIVITIES

The Committee has followed its excellent special report on the effectiveness of the Nation's hurricane warning system in connection with Hurricane Agnes of last year with a summary of its views on improvements that are required in the short-period disaster warning systems. I agree with these views wholeheartedly. The President's 1973 and 1974 budgets provided substantial increases for facilities, personnel, and equipment required to bring about the kinds of improvements proposed by NACOA for the Nation's disaster warning program. Although much remains to be done to implement the NACOA proposals, these increases will provide for improved geostationary satellite systems which will give us views of small-scale weather phenomena, increased computer capacity which will allow us to deal in a physical/numerical sense with much smaller scale phenomena than we have hitherto, and incremental improvements in the communications and automated observation systems recommended by the Committee.

The Administration agrees fully with the Committee that local communities must prepare themselves to take action when severe weather or floods threaten. To insure that the most efficient use is made of these improved disaster warning systems, the Administrator, NOAA, and the Director, Defense Civil Preparedness Agency (DCPA), have recently entered into a formal agreement between the two agencies to work together toward more effective community preparedness.

We are pleased that the Committee regards the NOAA program for automation of field operations and services (AFOS) as being an important activity which can bring about the introduction of modern technology into the forecast and warning process. By using advanced communications and display technology for modernizing

weather station operations, we will be able to cut the response time of the warning system significantly and to increase the reliability of the transmission and dissemination of warnings. Prototype development of the AFOS system is moving ahead rapidly. A Model Facility to demonstrate the feasibility of the concept is now under contract.

It is my intent to continue to support the kinds of programs that are recommended by NACOA in order to insure that this Nation has the best warning system that our technology can provide.

The Committee, once again, has raised the issue of the technical content and the organization of the Federal Government in the field of weather modification. It expresses its concern that the weather modification programs of the Federal Government have been declining in funding, and management of these programs has become even more diffuse. It has again recommended that NOAA be established in the lead role for carrying out certain Federal weather modification activities. We interpret the Committee's advice as not precluding the need of agencies such as the Departments of Transportation, Agriculture, Interior, and Defense and the National Science Foundation from carrying out operational and research activities closely related to their missions.

One of the benefits of the establishment of the DENR will be to permit new opportunities for more effective planning, coordination and management of weather modification activities of the Departments of Commerce, Interior, and Agriculture. As a result, technical progress should be accelerated.

The Committee's concern with the decrease in the funding available for research in the field of weather modification is appreciated. For certain aspects, however, there have been substantial increases in the Nation's weather modification activities in the President's budget request for fiscal year 1974. These increases are mainly for capital equipment, principally heavy research aircraft equipped with modern instrumentation. For some time we have been concerned about the growing and critical obsolescence of the equipment available for weather modification activities. We have taken the decision this year to place the greatest emphasis on modernizing the capital equipment structure underlying the Nation's weather modification program. This action reflects the Committee's concern for the general state of the capital structure in oceanic and atmospheric affairs and strengthens our research capability.

Essential to the national weather modification effort is the kind

of basic science support funded by the National Science Foundation. This research over many years has contributed much to our present-day understanding and technology. The present program of weather modification research in the National Science Foundation will assist operational responsibilities of various agencies, including those to be incorporated into the DENR.

The Committee has reiterated its concern, expressed in the first annual report, for the public policy issues as well as the legal, social, and economic impacts of weather modification. Studies, sponsored by the National Science Foundation and the Departments of Interior and Commerce, are now underway to provide information on these vital aspects of weather modification.

FISHERIES ACTIVITIES

The Committee has again emphasized the predicament of the U. S. commercial fisheries. This situation daily grows more serious. I share the Committee's concern for the need to insure an economically healthy fishing industry in the United States. During the past year, we have taken some important steps and we are pleased to see their endorsement by NACOA. I am especially gratified to see the Committee's strong support for passage of the High Seas Conservation Act submitted by the President to provide a basis for improved management of our coastal fisheries; and, secondly, its support for the new State/Federal management program which the Department of Commerce is fostering cooperatively with coastal states.

During the past year, I have directed that we take a much stronger position in our international fisheries negotiations in order to protect and conserve the resources on which our fishermen are dependent for their livelihood. I am sorry to report that at the last meeting of the International Commission for the Northwest Atlantic Fisheries, the nations which fish off our East Coast were unwilling to reduce their total effort. I have indicated that we will reconsider our membership in that Commission if, through it, the necessary conservation of our fishery resources cannot be achieved.

The Committee again raises the issue of a national plan for use of the national fishery resources. I agree that a longer range plan is required, and I have directed the Administrator of NOAA to formulate such a plan.

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