

and mine the manganese nodules. We believe that our private sector has outstanding managerial skills required to organize the human, material, scientific, and capital resources required to get the job done.

The role of science and engineering is to respond to industry's needs with innovative discoveries and techniques that will maintain our leadership in ocean technology.

And we must weld the efforts of all these three segments into a cooperative whole that moves as a single integrated unit toward clearly defined goals that advance our interests.

But we must approach our ocean tasks in the full realization that we must protect our precious environment and conserve the resources within the ocean. For if the oceans are to sustain us with renewable living resources, if they are to sustain a growing interest in marine recreation, and if we are to discharge our duties to ourselves as citizens, then we must insure a quality environment.

Today, our wetlands, and the irreplaceable fish and wildlife resources

they support, are endangered by growing industrialization.

Our highly productive estuaries are being damaged by the run-off of pesticides and fertilizers needed to maintain high farm productivity.

And there are those who fear further pollution of the oceans through additional offshore drilling operations.

All of which adds up to an ocean management problem composed of new and complex dilemmas. And their resolution is another task for science and technology, which must devise ways and safeguards that enable us to meet our needs for quality as well as quantity.

So all of us here this evening will be tested. And it is not too much to say that the course of the future history of this nation may be riding on how well we meet this test.

Do we have the skills, the innovative ability, the determination, that enable us to meet the competition in developing the ocean's resources?

Do we have the capacity for cooperation that can multiply tenfold the strength of our individual efforts?

Above all, do we have the competitive spirit that will make us winners?

You may remember President Nixon speaking about this competitive spirit in announcing his new economic policy in August 1971. He said, and I quote, "A nation, like a person, has to have a certain inner drive in order to succeed. In economic affairs that inner drive is called the competitive spirit.

"Whether this nation stays number one in the world's economy, or resigns itself to second, third, or fourth place; whether we as a people have faith in ourselves, or lose that faith; whether we hold fast to the strength that makes peace and freedom possible in this world, or lose our grip—all that depends on you, on your competitive spirit, your sense of personal destiny, your pride in your country and in yourself."

This message, I think, has a special relevance for every one of us in this room. And if I'm any judge of the American character, that spirit is alive and well and kicking among the people leading our country's effort to tap the vast treasures of the ocean.

## The Future of the Fisheries III. Sounding Our Ocean Future

ROBERT M. WHITE

I am pleased to be with you today, and not only because of the magnificence of Seattle and the warm hospitality one always encounters here. We have a great deal to do, and I cannot imagine a finer place in which to set about it.

First, however, I should like to express appreciation to the many organizations and persons, here and elsewhere, whose effort has helped bring

this conference to reality.

We have assembled many of the nation's oceanic leaders—in government, industry, and the environmental and academic communities, to exchange candidly their views on the way America should go in the oceans. It is my hope that three days from now, we in Government will have a clearer understanding of your opinions about our national ocean priorities, and perhaps of the way to go about achieving them.

For industry, we hope new opportunities will be identified. The week

will also afford the opportunity for those dedicated to the preservation of the quality of the ocean environment to express their views. We hope, too, that ocean scientists of all disciplines will find new ways to contribute their talents to meeting national needs.

I hope all of us will leave Seattle with a better understanding of the different roles and responsibilities of government, industry and others—and how to go about moving ahead in exercising those roles and responsibilities.

In some respects this gathering may be considered as a kind of stocktaking.



White

**Robert M. White is the Administrator of the National Oceanic and Atmospheric Administration.**



Five years ago, a congressionally-mandated Presidential commission published its landmark report, "Our Nation and The Sea."

The commission offered recommendations on all facets of our national ocean needs—marine science and technology, manpower, management of the coastal zone, living and non-living resources, environmental protection, global environmental monitoring and prediction.

Since that report there have been numerous ocean conferences, but there has not been a comprehensive assessment of our oceanic efforts. This is a time for such an assessment.

Many recommendations of the commission have been implemented fully, others have been carried out in varying degree, others deferred or dropped. Almost all recommendations involving environmental pollution, for example, have been acted upon. Under President Nixon, we have seen the emergence of the Water Pollution Control Act, the Ocean Dumping Act, the signing of an International Treaty on Ocean Dumping, and the creation of the Environmental Protection Agency and the Council on Environmental Quality. Similarly, those recommendations relating to the law of the sea—dealing with fisheries, seabed resources, freedom of navigation, and scientific research—have had a significant impact on the U.S. position at the preparatory meetings.

The Commission's principal organizational recommendations have been adopted with the President's establishment of the National Oceanic and Atmospheric Administration and the National Advisory Committee on the Oceans and Atmosphere. Now the President, as we all know, has proposed establishment of a Department of Energy and Natural Resources as a part of his program to deal with the nation's energy and natural resource problems and opportunities. He proposes that NOAA be transferred to this new department. This is a vital step in the evolution of our organizational mechanisms to deal with our

ocean environment, and one which deserves the support of all citizens. The Commission's recommendations with respect to the management of the coastal zone have become law under the Magnuson Coastal Zone Management Act. Largely through the efforts of NOAA's Sea Grant Office, many functions of the coastal zone laboratories proposed by the Commission have come to life. Aquaculture is being studied on a broad and coordinated front, and a National Marine Advisory Service is being developed.

The Commission recommended the rapid development of our seabed oil and gas resources. President Nixon's recent energy message has indicated that the United States will triple its rate of offshore leasing for oil and gas.

The Commission's advice concerning an environmental monitoring and prediction system is on the road to reality. Ocean data buoys are under development. Sophisticated satellite systems are operating. Communications have improved. Tsunami warning efforts have intensified. NOAA has in place a marine weather service for those who use the seas.

The Commission's recommendations for intensified ocean research and for improved collaborative efforts with other nations are being carried through. The International Decade of Ocean Exploration, under sponsorship of the National Science Foundation, is producing the kind of major research programs urged by the Commission—for example, the Mid-Ocean Dynamics Experiment, its Upwelling Experiment, and others. We are seeing the beginnings of a University-National Oceans Laboratory System.

We are reaching out to other countries in new, exciting, joint programs. We are collaborating on a bilateral basis with the Japanese, the Canadians, and the French. With the French, this year, we have commenced the pioneering underwater exploration of the Mid-Atlantic Ridge. And only a few weeks ago in Washington an agreement was signed between the U.S. and the USSR to pursue oceanic goals. Only good can

come of agreements like these.

On balance, we see significant progress.

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***"... there is a restlessness in the oceanographic community ..."***

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And yet, there is a restlessness in the oceanographic community, a feeling, perhaps, that we have not pushed hard enough or fast enough. There is no denying that a tight rein has been held on Federal spending as a matter of national fiscal policy, and that many programs have been affected. The Congress has concurred in the need for maintaining a spending ceiling on total Federal expenditures, as a key element of the national effort to provide a vigorous non-inflationary economy.

Our planning, however, should not be constrained by the present state of our pocketbook. We must continue to formulate and innovate and press for what we believe to be a desirable Federal program. But we must realize that we are planning programs that must compete for Federal investment with other proposed government efforts. If we produce a program the nation needs, and make clear that need, I am convinced that we shall obtain support. We must ask what government should and should not do in support of ocean programs. Increasingly, government applies much the same kinds of criteria as industry in deciding whether to invest in particular effort. For example, industry evaluates the market; government, the national need. Industry relates proposals to corporate objectives; government, to national policies and goals. Both consider the risk of failure; both establish overall program cost. Both determine the availability of capital and other resources. Industry measures return on investment in terms of profits; government, in terms of national well-being as well as an expanded tax base.

In the next three days we will be



thinking about energy, raw materials, fisheries, recreation, the coastal zone and marine transportation—the last in particular reference to its role in meeting the nation's growing and urgent energy needs. Each is a matter of broad, critical, national importance. To a greater or lesser extent the ocean and its resources play a role in fulfilling these needs. In some cases, it offers the only solution.

It is our hope that this meeting will sharpen our estimates of the scope, importance, and urgency of ocean resources in fulfilling these needs. In turn, this should lead to specific descriptions of what needs to be done, how, when and by whom—government or industry or both.

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**“... certain things have to be done...”**

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Certain things have to be done. Now is a time to sort them out. There are critical national requirements that only the ocean can fulfill. The transport of oil and gas from overseas is an obvious current example. If we are to reduce our dependence on foreign fish and fish products, we must either consume less fish—and that may include eating less chicken as well—or we must sharply increase the catch of our own commercial fishermen. Ocean recreation, an increasingly popular pastime, can only be had if we preserve access to the ocean and a quality ocean environment.

There are critical national requirements in the fulfillment of which ocean resources may prove the best of several alternatives. The offshore siting of nuclear power plants and deep-water ports are current examples. The potential yield of copper and nickel by deep-ocean nodules is another. Offshore production of oil and gas is, of course, an obvious instance.

One of our most vital responsibilities here, it seems to me, will be to draw clearly and precisely the lines of dependence between national, industrial, and human problems and the potential of

ocean resources for helping to solve them. I happen to believe a major Federal investment in ocean programs is not only desirable but necessary—but if we cannot make our case, the time for the oceans is not yet here. And this I cannot believe.

We cannot run the risk of talking in abstractions. We must describe our world in the terms used by the decision-makers. We must relate our efforts to the solution of the problems which command their attention. We must do so realizing that ocean solutions to national problems are by no means the only solutions being advanced. We have a great opportunity here this week to think and talk in those terms.

Let me attempt to do this in one novel way. Has anybody ever looked at something we might call the ocean balance of payments as one way to keep score on how we are doing? Such a concept has its deficiencies, but it is at least an intriguing way to demonstrate our dependence upon the oceans in quantitative terms. It also offers a way of expressing the importance of the oceans in terms which we can hope will speak to those we must convince.

As you know the Commerce Department constitutes, among other things, an impressive resource of statistics on virtually every aspect of the national economy. I have turned to our Bureau of Competitive Assessment and Business Policy for an estimate of the total 1972 factors contributing to what we might call an ocean balance of payments value. This figure includes not only the balance from existing trade in ocean products and services, but also in certain commodities where ocean resources—were they exploited, which they are not now—could provide important relief.

In developing these figures, we discovered that traditional Federal statistical reporting and analysis techniques are not always ocean-oriented. An analytical purist might consider the ocean balance of payments figure a kind of statistical bouillabaisse, but it will serve to make the point.

To put this figure in perspective, I must remind you that the *total* U.S. balance of payments deficit in calendar year 1972 was \$10.3 billion. Our adverse balance of *trade* alone was \$6.9 billion.

**“Ocean Balance of Payments, 1972”**

| <b>Item</b>   | <b>\$million</b> |
|---|------------------|
| <b>Petroleum, both crude and refined products</b>                         | <b>—4,000</b>    |
| <b>Natural gas</b>  | <b>— 400</b>     |
| <b>Fish and fish products</b>   | <b>—1,300</b>    |
| <b>Ocean freight charges</b>  | <b>—1,200</b>    |
| <b>Americans traveling from U.S. ports on foreign cruise ships</b>        | <b>— 263</b>     |
| <b>Raw materials we would expect to get from mining manganese nodules</b> | <b>—1,074</b>    |



It is abundantly clear that with our rising dependence upon foreign sources of raw materials and fuels, we should seek as a matter of general national policy to reduce this adverse balance. We have seen the economic effects of this drain.

The numbers I have been able to assemble indicate that the U.S. "ocean balance of payments" deficit for 1972 was more than \$8 billion. I doubt further study would prove it smaller, but I should not be surprised if it were larger.

Let us examine some of the more significant elements of this total. The largest single deficit account is petroleum—both crude and refined products—with an adverse balance of slightly over \$4 billion. In view of the present energy crisis and the higher prices being charged for foreign oil, it will be even larger for 1973. As for the 1980's—the estimates are staggering.

The adverse balance for natural gas in 1972 was \$400 million; by 1980 this total may rise as high as \$4 billion, depending upon the quantity of liquefied natural gas we import and the price we pay for it.

You may be shocked to find that the 1972 adverse balance in fish and fish products was \$1.3 billion—up 43 percent over 1971 and up 3/8 percent over 1960. We have no hard figures on the balance in fishing gear, marine electronics and the like, but you may be sure it is substantial.

Here are some other figures:

- For ocean freight charges, an adverse balance of approximately \$1.2 billion.

- For Americans traveling from U.S. ports on foreign cruise ships, approximately \$263 million.

- For those raw materials we would expect to get from mining manganese nodules on the ocean floor—their copper, nickel, cobalt, and other content—the 1972 adverse balance was some \$1,074 million.

I am not suggesting that the solution to all our raw materials and balance of payments problems resides in the oceans. Clearly, in the case of oil,

U.S. offshore production cannot be increased to wipe out the deficit—even if it were desirable, which it may not be. However, when roadblocks to expanded production are removed, which President Nixon has ordered done, we will ease substantially the dollar drain from this source.

The balance of payments, of course, cannot be the only consideration in adopting a policy aimed at the substitution of deep-sea resources for imports. Our national decisions must consider the impact of reduced buying on the economics of developing countries, balancing the interests and rights of the whole international community in the resources beneath the non-sovereign high seas.

But let us not lose sight of the fact—that our adverse balance of payments in ocean and potential ocean products and services is a number almost equal to the *total* U.S. balance of payments deficit, and it is growing in many important areas.

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***“ . . . the oceans . . . are a source of excitement . . . ”***

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The oceans are more than an economic entity; they are a source of excitement which, we should hope, will continue to be contagious. The ocean, like the enchanted forest of old, is an unending source of wonder and mystery, and sometimes of mysteries revealed.

Nowhere is this more evident than in some of the discoveries that have derived from basic oceanographic research, and in what these discoveries may mean to us in our search for adequate supplies of energy and raw materials to fuel our future.

Within the decade, marine geological research into plate tectonics and seafloor spreading have revolutionized man's view of his planet—of how oceans and continents form—and of why volcanoes and earthquakes occur where they do. From the pragmatic viewpoint, this "pure scientific research" has provided a more productive insight of where to look for oil

and other resources by illuminating, finally, just how these deposits were formed in the first place.

And now this same line of research is beginning to show us the conditions under which many of the hard-rock ore deposits on which we have so long relied ashore are formed. Knowing what we now do about the whole field of plate tectonics, and by tracing the source of such events back through geologic time, we may soon be better able to discover new deposits ashore.

Just as exciting as these discoveries is the challenge posed by the development of the techniques and technologies for their economic recovery. The prospect of competitive hardrock mining under the seafloor thousands of feet below the earth's surface appears today as difficult of achievement as the prospect of man walking on the moon seemed 20 years ago. But man has walked on the moon. One day, it seems reasonable to believe, we shall be doing things underwater which today seem incredible.

There are a great many ways to look at the oceans—and we should look at them all. They are a magnificent resource; they are also a fragile one which cannot indefinitely be abused, and which must carefully be preserved for the future.

The oceans are also an environment in whose quality we all have a stake. They are not only a place of resources, they are a place of enjoyment and beauty. Our ability to continue to harvest their resources depends upon the maintenance of this quality, as does our ability to foster growing recreational activity. Economic development and a quality environment can—and must—go hand in hand.

Our oceans are in truth a frontier. We are keenly aware of what we need and want from them. We are not wholly clear, perhaps, on where the responsibilities of government and others begin and end.

This week, if we can attain a clearer vision not only of what we want but how to get it, we shall have done ourselves and our nation a service.