

Statement of
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National Research Council
concerning the Oceans Act of 1988
before the Subcommittee on Fisheries Conservation, Wildlife, and Oceans
Committee on Resources
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Good morning Mr. Chairman and Members of the Committee. Thank you for the opportunity to speak to you today as you consider the proposed Oceans Act of 1998. My name is Dr. Kenneth H. Brink and I am a senior scientist at the Woods Hole Oceanographic Institution. I also serve as the chair of the Ocean Studies Board (OSB) of the National Research Council, and I am here today primarily in that capacity. The National Research Council is the operating arm of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine, chartered by Congress in 1863 to advise the government on matters of science and technology.

The Ocean Studies Board was established to advise the federal government and the nation on issues of ocean science and policy. The Board's members are leaders in ocean science and policy, employed both in academics and in the private sector. Most of our activities are initiated at the request of federal agencies. For example, we have carried out a number of studies for the National Oceanic and Atmospheric Administration (NOAA) on topics such as coastal and fisheries management (see accompanying list).

It has been about 30 years since the Stratton Commission was formed. It was a broad-based group that included scientists, policy makers and the ocean user community. The Commission was given a relatively broad mandate to examine ocean activities across a range of agencies in the United States. Based on its study, it produced a number of recommendations, many, but not all of which were implemented. Those that were carried out include the creation of the Sea Grant program (see NRC 1994c) and, most notably, the creation of NOAA as an agency responsible for both oceanic and atmospheric affairs. Thus, the Stratton Commission cast a very long shadow and its recommendations had a profound influence on the structure of ocean sciences that exists in the United States today.

The United States is the pre-eminent power in ocean sciences research in the world. This position has been maintained in part by a multi-faceted, flexible institutional structure as well as by a federal commitment to fund research in the basic sciences. Technology has also contributed heavily to the U.S. leadership position and has grown in ways that would probably have been inconceivable 30 years ago. For example, computing power has made possible extremely sophisticated ocean measurement systems and powerful numerical models of ocean phenomena. Satellite technology

and Internet communications have made it possible to gain sweeping views of the ocean's surface and disseminate this information rapidly to scientists.

Improved technology and growing scientific sophistication have made possible a number of remarkable accomplishments over the last decades. One stunning achievement in support of national security was our capability to detect and track foreign submarines in the open ocean, an accomplishment requiring an understanding of acoustics, signal processing, computing, sensors and ocean physics. Another impressive accomplishment involved the prediction of El Nino, an ocean-atmosphere phenomenon originating in the equatorial Pacific Ocean. Nowadays, we hear about El Nino daily, but it took a twenty-year sustained effort of observations and modeling to make the present impressive prediction capability possible. Routine prediction will, in time, lead to substantial savings to the U.S. economy by making adaptive agriculture and other mitigation practices possible (NRC 1997).

Finally, the last 20 years has seen the astounding discovery of deep-sea hot-water vents. These hitherto undiscovered areas contain unique life forms that have given us a deeper, broader understanding of the structure of life itself. A fundamental discovery such as this sparks our curiosity, opens new doors for potential applications, and helps us to comprehend our place in the universe.

The overall success of the United States ocean science enterprise to date suggests that the Stratton Commission did its work well. For example, the prescience of placing oceanic and atmospheric matters in one agency paid off handsomely when it came to NOAA's important role in predicting El Nino events. But, the world, including the ocean science world, has changed dramatically over the last thirty years (NRC 1992). The Cold War has ended, causing us as a nation to rethink the motivation for carrying out at least national security research, including in the ocean. In addition, new fields of scientific inquiry have developed with new national investment. As a result, although the overall ocean sciences budget has increased somewhat, it has declined by a factor of two when expressed as a fraction of the total basic research funding in the United States. We are now faced with a range of new ocean challenges and opportunities that we were barely aware of 30 years ago. For example, we must address the issue of sustaining ocean ecosystems, including the role of fisheries management, and the importance of preserving marine biodiversity (NRC 1998, 1995, 1994a). We need to maintain or improve conditions in coastal areas in the face of pressures from development and an ongoing flow of substances from the land reaching the ocean (NRC 1994b). And we need to improve our capabilities for climate prediction on time scales longer than the few years typical of El Nino.

In this context of opportunities and challenges, a new, broad-based, ocean commission is quite timely. Ocean sciences in this nation have traditionally been scattered across a number of agencies, having different mandates, and having oversight by different congressional committees. This diversity is desirable in many ways, but it makes it difficult to gain an overall view of United States ocean activities. In light of the pressing societal questions connected with the ocean, and the changing context of science, it may be helpful to review our ocean activities in a more comprehensive way.

There are a number of issues that a new Commission could deal with, and I list a few examples here.

- In light of the important ocean problems that need to be addressed, are we making the right investments, in the right places, and at the right levels, to assure useful results and their dissemination?
- For a specific problem, is there an appropriate balance between long-term strategic research and more immediate "tactical" research, where answers are needed quickly? Within any single agency, it may be difficult to strike the right balance, given the press of immediate concerns.
- Ocean sciences involve complex, specialized facilities, such as ships, that require substantial lead-time and investment. Yet, facility needs change as technologies change. Are we well positioned to provide the right mix of facilities as they are needed?
- We deal increasingly with major scientific issues that require efficient cooperation among many agencies, institutions, and nations in order to meet our goals. Can coordination among ocean agencies be improved? The ongoing Global Change research program may provide useful lessons in this regard. We can expect a growing internationalization of many aspects of science, so coordination needs to be thought of both nationally and, as appropriate, globally.

I expect that any examination of the U.S. ocean enterprise will uncover both areas in need of improvement as well as praiseworthy aspects that can serve as models for change. A fresh look at the health and direction of the United States ocean enterprise could prove very useful and the National Research Council stands ready to assist as needed.

Thank you again for the opportunity to be present today.

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