Committee on Resources

Subcommittee on Fisheries Conservation, Wildlife and Oceans

Statement

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Mr. Chairman and other distinguished Members of the Committee:

I am pleased to submit this testimony for your consideration as you deliberate the merits of the Exploration of the Seas Act, H.R. 2090. You are to be commended for your commitment of time and inquiry into the complex issues represented by this bill, and for wrestling with the difficult challenges of setting wise ocean policy. As you contemplate the bill before you I urge you to consider it as a first step in addressing the national need for bold action to understand and manage the oceans.

I bring to you today the perspective of a sea-going scientist, as a research vice chancellor for one of the University of California campuses, and as the Chair of one of America's largest consortia of ocean-related institutions -- the Monterey Bay Crescent Ocean Research Consortium (MBCORC). MBCORC is a consortium of over 23 institutions of higher education and research located on the rim of the Monterey Bay Crescent. Our Crescent region is home to over 1700 researchers devoted to studying the oceans.

My testimony derives from being part of this consolidated community of ocean expertise and my own personal commitment of over thirty years of scientific inquiry. My decades of work have included numerous national and international collaborations to seek a better understanding of the seas. I speak to you today as a scientist, as a administrator of research, and as a father who hopes that the policies set today provide for wise management of our limited ocean resources so that my children and my children's children will have many or more of the same opportunities that you and I have today. I have studied the environment; my daughter is in university studying environmental policy.

Just over a year ago, in the summer of 1998, Mr. Farr and the Monterey Bay Crescent community were honored to host the National Ocean Conference in Monterey, CA. This national meeting drew our Country's ocean expertise together in one forum to explore and debate the issues for which you are charged to set policy. I'm sorry that all of you were not able to join us for those two days. If you had been there you would have found that much time at the conference was devoted to summarizing what is unknown about the oceans. You also would have learned, however, how much of the necessary exploration has already been well planned or is underway. In many cases what is most needed is simply empowerment and funding.

Dr. Sylvia Earle, "Explorer In Residence" at the National Geographic, was an honored guest at the conference. Her words spoken to the leadership of this country impressed me. I believe her words spoken then are appropriate for today. She reminded us that the greatest explorations in our history, which opened vast new frontiers and changed our lives, have always come from forward-looking leaders. President Jefferson sent Lewis and Clark to explore the unknown American west and President Kennedy challenged us to explore space. She pointed out that this is the time to do for the oceans what our predecessors did for the land and space.

Mr. Chairman and members of the Committee, now is the time to take on this bold challenge.

My testimony will address the specifics of the bill before you, will provide you with broader recommendations that I urge you to consider as you strive to set effective national oceans policy, and will provide you with examples of successful ocean exploration efforts that I believe will help inform your decision-making.

H.R. 2090 The Exploration of the Seas Act

I believe that the passage of H.R. 2090 is an important step in the right direction as our nation grapples with the immense and complex issues related to our oceans. Mr. Greenwood and his colleagues, including Mr. Farr, are to be commended for this effort. However, I also believe this is only one component of a broader need for strong national leadership and effective policies related to our oceans. I urge you to consider this as the first of several steps.

The Bill before this Committee is most welcome. The ocean is a frontier; it is so because it is vast, scientifically and politically complex, and technically difficult to probe. It is not, however, entirely unknown. For decades the National Academy, all of the federal scientific agencies, and the academic community have undertaken many detailed syntheses and studies. For example, I just came from a two-day meeting at the National Science Foundation at which many of the nation's leading undersea scientists debated what next steps to take for exploration of the seafloor in light of what is known and sought about its biology and geology. A high level review of such deliberations, coupled with a strong mandate and momentum for an international cooperative program, as proposed in H.R. 2090, would be most timely.

The National Science Foundation and the National Oceanographic and Atmospheric Administration need mandates and budgets to explore the oceans more vigorously. The passage of H.R. 2090 may help that happen. Our oceans are natural laboratories for the R&D of health related products, energy resources and services, and aquacultural products to name a few. In health and biotechnology fields, for example, ocean based research continues to be essential in the development of marine based pharmaceuticals, food additives, cosmetics, and orthopedic materials. Basic research on marine microorganisms is also helping us to understand such phenomena as disease processes and antibiotic resistant bacteria. In the area of food sciences, scientific exploration of biodiversity and sustainability is increasingly essential to food production and safety. Research in our ocean laboratories also contributes to understanding, development of products, and providing of services in energy and environmental fields. Scientists continue to study issues essential to the oil industry and alternative forms of energy, they continue to develop and implement oil spill response and clean up procedures and technologies, and there continues to be progress in our understanding of El Nino, Global Warming, and other environmental and meteorological phenomena. In addition to direct product development, our ocean laboratories will provide us with a behavioral science lab to learn more about animal and human behavior and adaptation to environments. Indeed, in the years ahead, the products and services being developed through scientific inquiry in the living laboratories of our oceans will have an

increasing impact on all aspects of our lives.

As you consider the merits of the Bill before you I urge you to consider it in the context of the need for a broader national policy to guide exploration and management of the oceans. As H.R. 2090 notes, these complex issues require cooperation from a multitude of organizations and countries. The issues cut across science, economics, and social values that are basic to the sustainability of our environment. H.R. 2090 seeks to identify the most likely participants in a coordinated oceanography program. It enables a process to identify existing cooperative programs that should be expanded and new programs that should be started. It will also recommend how to implement such a coordinated program. These are all important steps to setting wise policy. They are, however, not enough. I believe this Bill will have the greatest benefit if tightly integrated with plans for action and concomitant Appropriations.

Recommendations for a Broader Ocean Policy Approach

H.R. 2090 recognizes the vast need for a larger and better scientific base for effective national policy. I agree with that assessment. I also believe, however, that the synthesis of the data and the commitment to coordination as represented by this Bill is only a piece of a much more comprehensive challenge.

I urge you to couple your passage of H.R. 2090 with a commitment to a bolder and more far reaching effort to establish an effective policy framework for our country. Mr. Farr has introduced the Oceans Act of 1999, which seeks to create such a framework. The combination of the Exploration of the Seas Act and the Oceans Act would contribute to a solid course of wise and effective oceans policy.

We need more than the collection of data and creation of knowledge about the oceans in order to make good policy. As a scientist I can attest that more data and better understanding are critical. However, as a citizen interested in the policymaking business in which you are engaged, I also realize that more than data and scientific understanding must be factored into the difficult and complex decisions you face. Your job is not easy as you wade through the data and the options. It is in recognition of that difficulty that I urge you to look seriously at the creation of a Commission on Ocean Policy as put forth by Mr. Farr's in his Oceans Act of 1999.

The establishment of a Commission on Ocean Policy as provided for in the Oceans Act would provide this country with focused and sustained leadership dedicated to the issues of the oceans. Such a Commission would look beyond the current data collection and knowledge creation to the broader issues of process and policy creation. I believe that the need is great and the timing critical for such a bold approach. In addition to your support of H.R. 2090, I urge you to work to establish such a commission through your support of the passage of the Oceans Act of 1999.

Examples of efforts that support the benefits of a coordinated approach

As you give serious thought to the merits of both the Exploration of the Seas Act and the value of a broader ocean policy as reflected in Mr. Farr's Ocean Act of 1999, I want to emphasize to you the concurrent need to support the national and international ocean exploration efforts already underway. To that end, I provide you with the following recent examples of the wealth of information and thoughtful recommendations that are paving the way for the successful implementation of the Bill before you. These examples are intended to both provide you with context for the Bill you are considering and to help you understand the importance of sustained integrated scientific inquiry.

The Ocean Drilling Program (ODP) - an NSF funded program

My first example of successful international ocean science collaboration is in scientific ocean drilling. Last year, the Ocean Drilling Program (ODP), and its predecessor, the Deep Sea Drilling Project (DSDP), completed 30 years of operation with an outstanding record of achievements. ODP is an international partnership of scientists and research institutions organized to explore the evolution and structure of the oceans and the Earth. ODP provides international access to a vast repository of geological and environmental information recorded far below the ocean surface in seafloor sediments and rocks. International participation in this deep-sea drilling effort is one of its most distinctive features. Eight international members representing over 20 countries currently provide funding for the Ocean Drilling Program.

This program officially began in 1968. In addition to the major engineering feat of the first voyage which included drilling in water depths greater than 5000 m and penetrating 700 m into the seafloor, scientists recovered the oldest rocks ever found in the deep ocean and discovered deep-water petroleum and salt dome cap rock. The early days of scientific drilling in the program were remarkable from a technological standpoint because they were drilling in the deepest parts of our oceans, in water depths to which the oil industry is just now moving, 30 years later. One of the most successful technologies developed, the hydraulic piston corer, has proven to be a keystone for the study of Earth's past ocean climate. Indeed, it is now known that climate cycles are controlled by the very regular and predictable variations in the Earth's orbit because of the studies that were done on sediment collected with this tool. This understanding represents one of the greatest geoscience success stories of the century. Over the past few years, the ODP has discovered that the Earth's biosphere extends into and far below the seafloor, a discovery that has far-reaching and broad science implications. Understanding life in these extreme environments will open up many new areas of research that will have a significant effect on societal issues.

The ODP ends in 2003, and planning is now under way for a future program. The future program, Integrated Ocean Drilling Program (IODP), will operate multiple ships to address more challenging science objectives. The Japanese recently made a $500 M commitment to IODP by starting the construction of a new state-of-the-art scientific drillship. Based on recent international meetings and reviews, it is clear that international collaboration in scientific ocean drilling must continue and can play an important role in an integrated ocean observing system which is now emerging as a US national and international imperative.

The ODP is representative of the type of coordinated international science that will inform the report being proposed by H.R. 2090. It is also the type of international effort I'd hope to see endorsed by the report in the Bill. I provide the summary of this program here as an example of what can and should be done. I also provide it here as an example of why sustained, long-term funding commitments are critical for significant progress to be made in understanding our oceans.

Integrated Oceanic Observing Systems

My second example highlights the need for timely passage of this Bill. There is currently an active movement within the ocean science and technology community to develop an integrated and sustained ocean observing system. This system will finally enable marine scientists, managers and decision-makers to develop a consistent, long-term understanding of how the oceans, from local estuaries to the deepest ocean, work and change over time. I understand, Mr. Chairman, that there is a planning effort underway that was initiated by your letter to the National Ocean Research Leadership Council and that this new plan is

expected to be delivered to the Hill in January.

Once the U.S. has developed its requirements, the international community must become involved in those areas that make sense. We have had great success working with the Pacific Rim nations to implement an observing system for El Nino and La Nina. We will need to come to similar arrangements as we develop systems to understand the effects of the North Atlantic Oscillation on fisheries production or the impact of eddies in the Gulf of Mexico on petroleum exploration and the expanding hypoxic dead zone. The Bill before you, H.R. 2090, will help both support this important effort and to integrate it into a broader picture of the ocean issues before us as a nation.

Marine Biocomplexity

My third example concerns the widespread international recognition of the need for a systematic large scale all-taxa marine biocomplexity pilot project with international participation and audience. Such a pilot program would catalyze, co-ordinate, and focus attention on marine organisms and habitats essential for fisheries, harbors, conservation, and recreation by building on existing expertise and relevant technological and research innovations concentrated. Two areas that have been targeted by domestic and international scientists for such study are the Monterey Bay where I live, and the New York Bight.

For many years, federal agencies, international bodies, and private foundations have recognized the need for a marine biocomplexity pilot project. This has resulted in the formation of national and international bodies, completion of scientific and policy reports, and calls for action (e.g., the 1995 National Academy of Sciences "Understanding Marine Biodiversity" report). There is national and international need for the organizational experience, scientific protocols, ecological data, and policy development that will result from the project. In particular, such a project would provide experience that is necessary for US participation in the International Biological Observation Year (IBOY), proposed for 2001 and endorsed by AAAS and other national and international science bodies.

In order for a major breakthrough to occur in this field, many disciplines, institutions, nations, and technologies need to be deployed in a focused and coordinated fashion and in one or two locations that are biologically rich, manageable in size, and proximate to extensive scientific talent. Choice of regions, allocation of sufficient resources, and involvement of multiple agencies and institutions require national leadership because it is slow to rise through conventional processes. The focused approach proposed by H.R. 2090 could be a step in the right direction to support this important effort.

Recent Reports and Efforts

In addition to these major integrated scientific undertakings, I also note the following recent reports and efforts that would benefit from the passage of H.R. 2090 and the establishment of a broader ocean policy. I have chosen these few examples to highlight the diversity of issues on which considerable effort has already been expended. Each of these programs stands to benefit from your actions today.

National Science Foundation - Task Force on the Environment

Recently, the NSF's Task Force on the Environment issued an interim report about how best to coordinate federal environmental science. Biocomplexity is an essential component of that vision, and the oceans are the most diverse yet least well known in this respect. This NSF report, prepared under Dr. Caldwell's leadership, represents a head start to the efforts called for in H.R. 2090. Your leadership in preparing a

context for action on that report, specifically as its affects the oceans, is an important next step.

President's Committee of Advisors on Science and Technology (PCAST)

In 1998 the President's Committee of Advisors on Science and Technology (PCAST) issued an excellent report entitled "Teaming with Life: investing in science to understand and use America's living capital". Although not limited to the oceans, this report provides some of the overview and recommendations needed for effective implementation of the Exploration of the Seas Act and the Oceans Act of 1999. Though thoughtfully prepared this report has not yet been acted upon.

Harvard School of Public Health Report on Marine Ecosystems and Emerging Diseases

Also in 1998, a NOAA-funded study was published by the Harvard School of Public Health entitled "Marine Ecosystems: Emerging Diseases as Indicators of Change". This was a retrospective evaluation of trends in ten factors that monitor the "health" of the Gulf and East Coast oceans. No such study has ever been made of our West Coast or territories, and such study is desperately needed. Nor are sufficient programs in place to monitor these waters thoroughly and systematically in order to inform policy necessary to preserve high priority future uses.

National Marine Sanctuaries

A final example is the importance of our National Marine Sanctuaries in managing and understanding our marine resources and issues. The establishment of the National Marine Sanctuary program was a significant commitment by this country. However, despite that important policy step, the utilization of our sanctuaries for sound science and education has been lacking due to insufficient funding and enabling policies. In addition to the obvious importance of our Sanctuaries for science, they are also a place where the public, users like researchers and fishermen and scuba divers and school children, can be engaged in the ongoing management and stewardship of these valuable marine ecosystems. We are finding, however, that sanctuaries, such as the Monterey Bay National Marine Sanctuary a few blocks from my home, only can begin to tap into the energy and talent of the public due to limited funding for programs of outreach and training. These national assets remain untapped resources as we seek to engage generations of Americans in the critical appreciation of our natural resources and their necessary stewardship.

Recently the Deputy Speaker of the Australian House of Representatives who was visiting America, my region, and my university to get ideas for a marine research center in Australia visited me. He was much impressed with the Monterey Bay National Marine Sanctuary and asked about how it was created and funded. He was not much impressed with its budget, however (less than a million dollars for an area greater in size than the state of Connecticut). As an Australian legislator, he was familiar with the unequal distribution of funds between east and west coasts of his continent and he commented on the same inequality he observed in America. This is an important observation that I hope will emerge from the review called for in H.R. 2090. I further hope that the passage of H.R. 2090 and the Oceans Act of 1999 will help rectify such inequalities in the future.

Closing Comments

In closing, as a scientist and science administrator, I thank you, Mr. Chairman, for holding this Hearing. Your consideration of H.R. 2090 is an important initial step but I urge you to go further in the exploration, understanding, and sustainable use of the oceans. This country needs a strong policy framework that

establishes a sustained and integrated approach to sound policy making. I urge you and your Committee to support H.R. 2090. Further I urge you to seriously consider the broader complex need for a national policy framework and the recommendation to establish a Commission on Ocean Policy as introduced by Mr. Farr in the Oceans Act of 1999. Finally I urge you to support bolder exploration of the oceans themselves, such as through the Ocean Drilling Program, Integrated Oceanic Observing Systems, and Marine Biocomplexity initiatives. If these are authorized and allocated their requested funds, you will have begun to follow Jefferson to the west and Kennedy to space.

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