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Mr. Chairman, Commissioners, good morning. It's really a pleasure to be here with you today. My name is Jane Lubchenco. I'm the Wayne and Gladys Valley Professor of Marine Biology at Oregon State University. My Ph.D. is in biology from Harvard. My immediate expertise spans a range of critters, including sea urchins, crabs, snails, barnacles and the full range of invertebrates. I do a lot with sea weeds and also with vertebrates, such as fishes.

The areas that I work on are primarily rocky seashores and coastal near-shore habitats around the world, and I work on a range of topics including climate change, biogeochemistry, aquaculture and just simple dynamics of how near-shore ecosystems work. I am serving on the Pew Oceans Commission in part because I believe that our country is on the verge of a major reorientation in the way that we think about oceans, in particular, the living oceans.

Over the history of the U.S. there have been a few catalytic state changes in the way we as citizens of this country think about and have a collective world view of certain kinds of issues. Some of these changes have focused on social phenomena, like changes in the way we think about slavery, or changes in the way we think about civil rights. Others concern our relationship to the natural world. These state changes are not the result of any single dramatic event that happens, but they accumulate over time, often beginning relatively slowly, building as there is new information, new awareness, new evidence that something is wrong with the current view about how we view the world.

As this information dawns on and more evidence accumulates and influences more people, there is often a rapid development phase resulting in sometimes a very dramatic change in collective awareness and action. In these search angles, if you will, the presence of strong visionary leadership is absolutely critical. I believe we are on the brink of such a state change -- a sea change -- and that everyone in this room, especially the Commissioners, has an opportunity to guide or strongly influence the outcome. The outdated view of oceans says that they are so immense and bountiful that there is very little that human activities can do to really change the way the oceans function, the chemistry, the physics, the physical structure, the biology of oceans. The accumulating evidence says this is simply not true. A variety of the activities that humans are engaged in, in fact, are having very significant and very dramatic influences.

These include the collapse of numerous fisheries and the serious social and economic consequences to fishing communities; increased frequency of harmful algal blooms, with the consequent human health and economic consequences; the appearance of zones of anoxia or hypoxia, the so-called "dead zones" that are accumulating around the world (there are now more than some 50 of those, most of which have appeared within the last 30 years); the increasing frequency of coral bleaching; and the increasing disruption of coastal ecosystems, etc. These and other changes point to the emerging evidence that a new view of oceans is indeed in order.

The awakening view is that living oceans are both more valuable as well as more vulnerable than we have commonly appreciated. The recognition of this value and of the vulnerability brings the responsibility for more enlightened stewardship.

The Pew Oceans Commission is focused on these changes in our living oceans and puts a high premium on seeking the best possible and the most current scientific information to guide our understanding of the issues and to influence kinds of recommendations that we are making.

As we have gone around the country and sought input in a variety of public forums, we have also taken advantage of the scientific expertise around the nation and invited experts on a wide variety of topics to come and brief the Commission much as you will be doing.

In addition to hearing from scientists, we've been doing two other things to get good scientific input. Leon Panetta has mentioned to you the fact that there are four practicing scientists on the Commission: Charlie Kennel, the Director of Scripps Institute of Oceanography; Cathy Sullivan, Astronaut, Oceanographer, and director of Coastline; Jeff Heal, an outstanding economist at Columbia; and me. The four of us are active participants and have really enjoyed our interactions with all of the other Commissioners.

The third way that we have been paying attention to and informing ourselves about the science are these commissioned papers that have been mentioned to you. And I would draw your attention to the packets that each of you have. In there are copies of three of the scientific papers that have been commissioned. In each of these cases these are scientists that have written the documents are experts in the field. The documents have been extensively peer reviewed. They are published to inform our thinking and we have invited many of the scientists who have written these documents to give us recommendations, but the recommendations in here are not necessarily those that will be made by the Commission. So these are independent scientific papers providing us with state-of-the-art summaries of a variety of topics. The three that we have finished are *Marine Aquaculture*, *Marine Pollution*, and *Introduced Species*. We have a number of other ones that are in various stages of preparation including one on fisheries, one on coastal development and one on marine protected areas and marine reserves.

The Marine Pollution report was authored by Dr. Donald Boesch of the University of Maryland, and a number of his colleagues. They find that despite 30 years of progress, including significant progress in reducing pollution from ocean dumping, waste treatment facilities and toxins such as DDT, our coastal waters remain in very serious peril. And the report calls for solutions that combine voluntary and regulatory approaches to pollution abatement.

The Marine Aquaculture Report was co-authored by Dr. Rebecca Goldburg and Matt Elliott of Environment Defense, and Dr. Ross Naylor of Stanford University. This particular report examines the role of the emerging U.S. aquaculture industry in meeting the nation's demand for seafood and its current and potential impacts on the marine environment. The authors recommend steps to insure that domestic aquaculture grows in a sustainable fashion and calls upon the U.S. to take a global leadership role in adopting the best practices.

The *Introduced Species Science Report* is the most recent one authored by Dr. Jim Carlton of Williams College. Dr. Carlton describes a game of ecological roulette which is

playing out along our coastlines with hundreds of species arriving each day by way of ships' ballast water, but also by fishing activities, by aquaculture and by other means.

Jim details that the rate of marine introductions has risen exponentially over the past 200 years and shows no sign of leveling off. He highlights the loss of coastal habitats in biodiversity and the millions of dollars that are spent each year to research and control introduced species.

Carlton recommends compulsory ballast water management program, an early warning and rapid response system, and greatly expanded research and public education on this very important topic of introduced species.

We look forward to receiving the recommendations of the other science reports underway on coast development, fishing and marine protected areas and marine reserves.

I want to focus very briefly on one of the Commission's key areas of study, specifically that of coastal development. There are several areas that we are reviewing. They include providing a significant, dedicated and permanent source of federal funding for habitat protection and wildlife conservation in our coastal areas.

Second, they include reorienting government programs that affect coastal resources toward habitat restoration and smart growth — programs such as CZMA, for example, or the National Flood Insurance Program.

The third area for review in the coastal development arena is to link existing laws to provide much more comprehensive protection of coastal watershed. For example, the Clean Water Act, NEPA, non-point source solution.

A fourth area in this coastal development portfolio is to provide local communities with the tools and the skills that they need to manage growth more effectively and smarter. And a final area is to include local and regional governments in development and decisions to protect critical functioning ecosystems that are right off their shore.

Much of the dialogue within the Coastal Development Commission acknowledges both land-based and ocean-based activities that converge on our shorelines and that to really do justice to the maintaining functioning marine ecosystems and healthy marine communities we need to pay attention to activities happening both on the land as well as in the ocean.

Finally, the Commission is looking at the critical role of marine protected areas and marine reserves in the challenges that are emerging in ocean management and the potential that they have as an important new tool for promoting marine biodiversity, for protecting habitats and for improving governance and enhancing fisheries. So the emerging scientific evidence suggests that ocean-based and land-based activities together are dramatically changing, especially the coastal areas of our living oceans. We are literally changing the chemistry, the physical structure and the biology of our oceans in unprecedented ways. And we are suffering the consequences as we have one disaster after another. And it is time that we get ahead of the curve which means recognizing and thinking about oceans in a very different way from what we have before.

As you think about your dauntingly broad challenge, the information and recommendations that have been developed by the Pew Oceans Commission informed in part by the very broad and excellent scientific input that we've had, I believe, will be invaluable to you and I look forward to continuing to offer and to share what we are learning and doing with each of you.