U.S. Commission on Ocean Policy

Testimony of Sylvia Earle
Explorer-in-Residence, National Geographic Society and,
Founder, Deep Ocean Exploration and Research, Inc.

(Text based on meeting transcript)
U.S. Commission on Ocean Policy
Northwest Regional Meeting
Seattle, Washington
June 13, 2002

I come here today, Mr. Chairman, members of the Commission, wearing several hats. I am Explorer-in-Residence of the National Geographic Society, director of the marine program at Corpus Christi, director of marine conservation for Conservation International, chairman of the company I started that my daughter runs, called Deep Ocean Exploration and Research, and a member of People for Puget Sound. But mostly, I am pleased to have this opportunity to address the U.S. Commission on Ocean Policy as somebody who has had the pleasure of exploring the coastal waters of the United States over a lifetime, but particularly during the last four years as a part of a public private partnership called Sustainable Seas Expeditions, with funding from a foundation based in San Francisco, the Goldman Foundation, the National Geographic, and others, really quite a remarkable expedition that has involved teachers, students, and a number of scientists and new technologies.

Like most of your own Commission, I have lived during an era when ocean policy was greatly influenced by the nation's first Ocean Commission, headed by Julius A. Stratton. Among the merit badges that I have been given over the years, I particularly treasure something called the Julius A. Stratton Leadership Award. Stratton has been one of my heroes. And I have been personally influenced by him. And of course I have known and worked closely with some of your present commission for many years. And you and I know, as well as anybody on the earth, probably better than most considering our interests, that the world has changed significantly since the Stratton Commission, especially notably the ocean since those days in the 1960s when people were deliberating, as much as you are deliberating now and just two weeks go. I was here in Seattle to help celebrate the 70th birthday of the Northwestern Fisheries Science center. We saluted some of the past directors who served during the time of influence of that first commission on the oceans in the early days of the fisheries here in Seattle. The commission was basically how to extract and use the ocean's resources and fish more efficiently and effectively, develop new gear, and so on. But now the mission has turned to how to restore and care for what remains of those once much more vibrant resources.

I had a chance to meet with a fellow aquanaut whom I haven't seen in a number of years who has quite a lot to do with salmon research here in Seattle. In a sense, I think of him as a fish, because he lived under water for some time. He was one of the original aquanauts. We both experienced an era when the agency that was most responsible for ocean issues was the Department of Interior. By 1970, all that changed and NOAA emerged as part of the Department of Commerce. But NOAA was formed on the recommendation of the first Stratton commission. It wasn't put in the Department of Commerce under the recommendation of the Stratton commission. Rather, the idea was it should be something like a wet NASA, which was the term of the time.

You were asking for some specific recommendations. Well, one specific recommendation that I can give from the tips of my flippers is some consideration ought to be given to a different kind of home for the ocean agencies. It is not that the Department

of Commerce is an inappropriate place, but there are other aspects of the way we view the ocean and what is out there in today's world that have changed since the time in the 1970s when that decision was made.

In our respective lifetimes, and especially the last 25 years, more has been learned about the world and the way it works than all preceding human history. Whether we are talking about understanding the nature of chimpanzees or listening to Jane Goodall speak, we all can agree that all of us have shared a time, all of us here, in the latter part of the 20th century, that up until the present time has been the greatest era of exploration ever. But hold on to your hats, because the greatest era of exploration is just beginning.

Recognizing how little we really know about almost everything, you know, one of the greatest discoveries of our time is, perhaps, understanding the magnitude of our ignorance. I love the words of one of the articles by the individual who crafted an article for the first issue of the *National Geographic*, who indicated then that when we embark on the great ocean of discovery, the horizon of the unknown advances with us and surrounds us as we go. The more we know, the greater we find is our ignorance. So here we are, here you are, looking forward into the 21st century with this knowledge base that is unprecedented. But we are aware of how little we really do know.

We have also converged on another more sobering conclusion. At the same time as we have learned more in the latter part of the 20th century, we have lost more than during all of the preceding history. Again, whether you are talking about fossil sites churned by highway construction, or in the ocean, the destruction or the disruption of historically valuable ship wrecks and natural systems such as coral reefs and species, from the many variations on a theme of salmon, North Atlantic cod, eastern grouper and snapper. All in all, many have been commercially exploited, and many species worldwide have been threatened or endangered because of our actions. More has been learned, but more has also been lost in our lifetime and on our watch than during all preceding human history.

Well, the 20th century was marked by a lot of positive things. My parents, like yours, or at least your grandparents, lived at a time before there was electricity, before there were lights that transformed the nightscape into that incredible glittering brilliance that you can see from space. They lived at a time when food was stored in ice boxes. They walked or traveled by horse-powered modes of transportation. People dreamed about flying during the early part of the 1900s.

But when you think about it, until the later part of the 20th century, we had the greatest success going down in the ocean than we did in the sky. Look what happened in the 20th century. Because of the investment that was made in technology taking us skyward, we really did see a transition from the era of the balloon to the era of spacecraft. The 20th century invested heavily in aviation and aerospace. It has paid off mightily.

Meanwhile, we have neglected the ocean, and it has cost us dearly. It is not to say that we haven't made an investment in ocean technology. Otherwise we couldn't have made the incredibility discoveries I was just referring to. I mean, think about nuclear subs that power their way around the world. We have developed the most precise maps of the ocean floor ever. But we can do better, a whole better than it was even ten years ago. We have awakened a new understanding of the way the world works with new technologies that have taken us into the sea. Yet less than five percent of the ocean has been seen at all, let alone really explored. Only once have humans been to the deepest part of ocean. It's only five miles. I flew seven miles overhead to get to this meeting eating lunch. You can watch movies. Kids can do this. But only two people and 40 years ago have been to the deepest part of the sea and come back. The sea is round trip. No one has even glimpsed the largest invertebrate animal alive on the earth, the elusive giant squid. In spite of efforts to find it, we are still chasing around not able to see it. To sample ocean depths, what

techniques do we use? Some are extremely sophisticated. But to assess populations of fish to determine how many of what kind live where, we drag nets, we drag dredges across the sea floor, collect the dead bodies, and count them. What is the impact on population from that process of taking a sample? To catch fish for commerce, we deploy long lines 10, 50, 70 miles long with weighted hooks every few feet, catching along the way tons of turtles, birds, sharks, lots of different kinds of fish that we refer to as trash fish. How primitive is that?

But on the other hand, we use space age GPS, weather reports, high-tech plastic lines, nets, high powered ships, the high tech means of finding out where the fish are, using satellite images to determine where the temperature patterns are just right for currents, just right for locating the fish. We are using global marketing networks that make it possible or profitable to use creatures that are taken from one side of the world and get them to the other side of the world in time for dinner the next day. In some cases we are succeeding in stripping the ocean in a few decades of species that took up to ten thousand years to achieve.

By the start of the 20th century, there was concern about what was being lost on the land as we could see it. It was all around us. The power to change the landscape was sufficient to arouse and inspire a handful of people to start to take care of the national and international legacy. Mostly thinking about our own nation, Teddy Roosevelt was one of those specific voices who made a huge difference in his time. The first land that was established as a national park was in 1872, before Teddy Roosevelt had anything to do with it, Yellow Stone. It was the same year as the first global expedition to explore the oceans of the world took place.

Yesterday I attended a meeting of the National Park Service Advisory Board, just twelve of us. We reflected on the history of the park services, how it started with that Yellowstone in 1872. Now there are close to 400 of them to protect our history, culture, and national heritage. When you ask people how they feel about our national parks, it gets a 90 percent approval rate. People love the parks. They love them for good reasons. Because they touch our hearts. They really do look to the future as well as to the past. Some say it is the best idea America ever had. It is sometimes characterized as an expression of faith in the future, a pact between generations, a promise from the past to the future.

Well, in 1982, a whole century after the first national park was established, the National Marine Sanctuary Program was brought into being formally with legislation. Now there are thirteen areas embracing eight thousand square miles. It is a young but promising counterpart to the national park system. We need to protect the ocean with specific areas coupled with overarching policies. The policies won't do. Specific areas won't do. The coupling of these overarching policies with specific places provides some hope that we actually can see a restoration of some of the problems that have occurred and protection of what remains.

There is little sanctity presently in the sanctuary system. Like the early days of the national parks when there was a bounty on wolves and on mountain lions, we don't have a bounty, but the sharks are fair game, so is everything else, both for sport and commercial taking. You used to be able to shoot the woodpeckers in the national parks that gave you a hard time. There is little to prevent people from doing anything they want in marine so called protected areas. Perhaps that will change in time. Maybe we will learn from the 20th century and take some of the things that worked on the land into the ocean. In the 20th century, there were those who thoughtfully were concerned about the future and made some of the most unpopular recommendations at the time. They were visionaries. But today we applaud them for their courage, for the willingness to think long into the future, those who gave voice to those in the future.

So what of the 21st century? I have four grandsons who will largely grow up in the 21st century. I have a very specific reason to be concerned about what it is going to be like. We need new technologies to explore and understand the ocean.

We are a global ocean. We need to act nationally of course, but we have to act globally when it comes to the ocean. There is absolutely no choice in the matter. The ocean is totally connected. The network of global ocean observing systems that I know you have heard about and many of you really support with your whole heart, and so do I, monitors the ocean the same way we monitor the land with weather stations. But going beyond simple physical characteristics, and even the chemistry of the air at sea, we need to go beyond that and monitor the biological character of the ocean in ways perhaps we haven't even charted yet. We need to achieve human access to the full ocean depth. We don't climb mountains 97 percent of the way to the top and stop. We want to know the whole mountain. Why are we stopping somewhere short of full ocean depth? We need to have, coupled with new technologies, a commitment to explore and to further research and to educate and communicate what we discover.

We need an ocean ethic that parallels the land ethic of the 20th century, an ethic that would transcend walls to think about the value of the oceans in new ways, common sense practices of using, but not using up, the natural systems that sustain us.

We need an ocean ethic that parallels the land ethic of the 20th century, an ethic that would transcend walls to think about the value of the oceans in new ways, common sense practices of using but not using up the natural systems that sustain us.

As Bob Ballard knows full well, of what we learned in the 20th century about the ocean, there are two things that really have emerged. One thing is we have learned that we are absolutely utterly dependent on the ocean. It doesn't matter where on the planet we live, the ocean is our life support system, generates oxygen, absorbs much of the carbon dioxide. It is populated from the surface down to the full ocean depth. Joe Allen, an astronaut put this into perspective for me. He said, as an astronaut, you learn everything you can about your life support and then you do everything you can to take care of your life support system. Those who go up in the sky, as well as those us who go down in the sea, never for a moment take a life support system for granted. We learn everything we can about it and do everything we can do take care of it. But Joe, talking about life support system, pointed to a view of the earth from an astronaut's perspective, mostly blue, and he said in a soft voice, "life support system."

We need to learn everything we can about it and do everything we can to take care of it. We careen around in an otherwise inhospitable and uninhabitable universe, and the ocean is of course our life support system. We came to grips with that or started to, at least in the 20th century of discovery.

The other big thing we learned in the 20th century, a great legacy of all that exploring was clear knowledge — it wasn't clear in the 1960s during that first ocean commission — that the ocean has limited resources. The ocean is vulnerable to our actions. We have the capacity to change the way the ocean works. If you change the ocean, we change the world. You change the way the world works, you are monkeying with our life support system through what we're putting in.

You know quite a lot about what are the consequences of putting things into the ocean. All of us have seen the consequences of changes in the coastal waters of our country, the dead zones that have come up in the last few years around the world. More than 50 have now blossomed. What we take out is another big factor that I want to focus on. We are influencing the ocean in ways that are not favorable to us.

When I think about what do about it, about solutions, the United States has the power to lead by example as well as by influence. And concerning that thorniest of issues, it makes sense to revisit the Magnuson-Stevens Fishery Conservation Management Act and consider the consequences of policies that seemed to make sense at the time, but do need to be adjusted in keeping with today's realities.

There are too many fishermen and just not enough fish. The means of taking fish are overly brutal to the ecosystems that are needed to yield the fish. And fish, we have also come to understand, have values that we now recognize that go beyond pounds of protein. Live fish are gaining respect now with what they contribute to the economy. Ask millions of snorklers and divers what they want to see when they spend millions of dollars to go underwater. They want to see fish, live fish, not dead fish. It is true that some of them like to eat fish, but they are a force to be reckoned with. They have paid quite a lot for the pleasure of splashing around to have face to face encounter with things like barracuda and grouper and sharks and even the occasional tuna.

We have also come to understand that live fish have ecological values comparable to the value of birds on the land. Nearly all birds, like nearly all fish, are edible. Most are palatable. But we have come to respect birds as critical elements of what makes the natural world work. We care about wild birds. It is big business. We certainly eat birds, Kentucky Fried Chicken, Thanksgiving birds, Christmas birds. But we don't supply fast food chains with quail burgers, or the supermarkets with fillet of eagle or owl. And we protect their breeding areas and their feeding areas. We don't take them just everywhere or just any time.

We have come to understand that there are limited amounts of what kind of wildlife can be extracted from the land and to do it on a basis that we can get away with. In fact, all animals that people cultivate to eat live in the wild as plant eaters. Otherwise we feed ourselves with just four grains, mostly wheat, corn, and oats and rice. We don't farm raise tigers and lions. It would be far too inefficient and too costly. To make a pound of chicken, it takes about two pounds of plants. For one of the lions or tigers or cheetahs of the sea, let's say a bluefin tuna, one that is sized favored for taking, a six or eight, ten year old tuna, think of the investment needed to make one pound of one blue fin tuna is a hundred thousand pounds of plants. At the end of a long and complicated food chain, a hundred thousand pounds of plants translates into ten thousand pounds of little grazers, which translate into about a thousand pounds of little crustaceans, which translate into a hundred pounds of little fish, and that in turn is ten pounds of fish that a tuna might notice.

So you can do the math. The higher up the food chain you go, the longer lived the creature, the bigger price we pay. We don't account for it, but we are paying it nonetheless. What does it take to make a tasty little meal from a 150 year old orange roughy or a chilean sea bass that may have hatched the year Lindbergh crossed Atlantic or rock fish that may be older than your grandparents? I don't think such thoughts were in the minds of people in the '60s or '70s or '80s. When the Fishery Conservation Management Act in 1976 was crafted to develop domestic fisheries and expel foreign fleets, it succeeded too well. The subsequent Fishery Conservation Act established eight fishery regional management councils to oversee management plans and so on. If the goal was to maximize extraction of fish from our U.S. waters from U.S. fishermen, we succeeded too well.

Our national ocean now is in serious trouble, yes, of course, in part because of what we put in, the pollutants. Most alarming is the disruption of the resilience of the natural environment brought about because of the huge quantities of wildlife extracted by the draconian methods we used.

You are familiar with the current decision-making structure in the process of the fishery council. I know you have heard as you traveled around the country. You may not be aware of the recommendations I personally endorse for creating an independent oversight body, an independent federal agency, a scientific advisory committee to oversee the conservation of fishery resources,

their habitats and related ecosystems, components of US waters, with specific emphasis on precautionary principles, promoting sound science-based decision making, ecosystem based fishery management, fostering interagency coordination in research and managements, who knows, maybe elucidating the important of fish in the sea as birds to the land as living resources, not just as pounds of protein.

The concepts that I am putting forth to you, the specific recommendations were articulated, first I know about it any way, in 1989 by Bill Fox. And speaking for dozens of scientists, concerned scientists' reauthorization of the Magnuson Stevens Act would help avoid inherent conflicts that blemish the function of today's councils. Whether the councils survive on into the future or whether they don't, a marine fisheries oversight commission, science based, independent, without the conflict of interest issues will go a long way toward providing a big important tool in a box of tools to help us restore health to our ocean's wildlife and the creatures, however one wishes to think of them.

So all in all, I have articulated concerns about what we're putting into the sea a bit. I focused a little bit on what we're taking out. When I am asked what is the
biggest problem facing the ocean today, I have to say it is neither of those. We have a very long list of issues that now face us. I think the biggest problem of all is simply ignorance, lack of knowing. It can be solved with the counterpart, that is, education. Admiral Watkins suggested that there was this wonderful occasion when people got together to address the issue of ocean literacy. How do we get people to know what some of us know about the issues? How do you get it implanted in little kids? We learn the ABCs and 123s. Where do we learn that we are dependent on the ocean? What we do to the sea, we are really doing to ourselves. Aquariums help. I consider them halfway houses for fish and people, that it is part way to the ocean. And they are extremely valuable as an education resource.

With Sustainable Seas, we have tried to reach the kids, reach teachers, reach the general public. In the first year, we started to take count of how many people we were reaching. More than 200 million people were touched by some means of being influenced by this expedition of taking little submarines around the coastal waters of the country and getting scientists involved as well as students, hundreds of scientists, hundreds of teachers, thousands of students.

Abraham Lincoln observed when you have pubic opinion on your side, anything is possible. Without it, nothing is. Public opinion derives from education, knowledge, or lack of it. I hope it will be part of what you take on yourselves, a recommendation to do whatever it takes to ensure that this nation becomes ocean literate through whatever means we have the power to achieve. There are success stories here in the great northwest to draw upon as we communicate what we can do to make a difference.

As we go forward, mostly I would like to respond to that question you asked for specific recommendations. I would like to suggest what I think you are already doing, but just to reinforce it, look at what you are doing today as if you were out there in the future, 25 years, 50 years, 100 years, and to think of how those in the future will regard us at this point in time, will regard you, will regard the recommendations, the decisions, the influence that you will have on our nation's policy, on the world's policy with respect to the ocean.

I suggest very specifically that you be brave. Don't be hesitant to think big. Visionaries are not always the most popular people in their time because they tend to shake things up. I ask very specifically that you do not think of what people today will think of you. Rather, think of what those in the future will think of you. We are faced with more decisions really as never before. We know enough to identify some of the serious problems. But as never again, we have an opportunity to do something about it.

Thank you.