S. HRG. 106–1041

CORAL REEF CONSERVATION AND THE REAUTHORIZATION OF THE NATIONAL MARINE SANCTUARIES ACT

HEARING

BEFORE THE

SUBCOMMITTEE ON OCEANS AND FISHERIES

OF THE

COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION UNITED STATES SENATE

ONE HUNDRED SIXTH CONGRESS

FIRST SESSION

JUNE 30, 1999

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ONE HUNDRED SIXTH CONGRESS

FIRST SESSION

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CORAL REEF CONSERVATION AND THE REAUTHORIZATION OF THE NATIONAL MARINE SANCTUARIES ACT

WEDNESDAY, JUNE 30, 1999

U.S. SENATE,
SUBCOMMITTEE ON OCEANS AND FISHERIES,
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,
Washington, DC.

The Subcommittee met, pursuant to notice, at 2:36 p.m. in room SR–253, Russell Senate Office Building, Hon. Olympia J. Snowe, Chairman, presiding.

Staff members assigned to this hearing: Sloan Rappoport, Republican counsel and Stephanie Bailenson, Republican professional staff; and Margaret Spring, Democratic senior counsel.

OPENING STATEMENT OF HON. OLYMPIA J. SNOWE, U.S. SENATOR FROM MAINE

Senator SNOWE. The hearing will come to order.

Before I begin, I would like to welcome the witnesses and others in attendance today for this hearing. I thank you all for coming.

At today's hearing we will be exploring coral reef conservation issues and matters relating to the reauthorization of the National Marine Sanctuaries Act. There is wide agreement that coral reefs are in decline. Today we will be addressing the status of coral reefs and what can be done to reverse this decline. We will also be hearing about the need to conserve our marine resources through the use of national marine sanctuaries. The successes and shortcomings of this program, as well as ways to improve it, will also be addressed by several of our witnesses.

First let me say a few words about coral reefs. They are perhaps one of the world's most biologically diverse and productive ecosystems. Coral reefs serve as essential habitat for many living marine creatures, enhancing commercial fisheries and stimulating tourism. They provide protection to coastal areas from storm surges and erosion and offer many untold potential benefits. For example, new drugs to fight cancer are currently being developed as a result of coral-related research.

Unfortunately, coral reef ecosystems are in decline. In 1998 coral reefs around the world appear to have suffered the most severe bleaching event in modern times. You can see what a bleached coral looks like in the poster that is to my left. There is a stark contrast between the healthy coral in the foreground and the bleached coral in the background.

Last year, reefs in at least 60 countries were affected and in some areas more than 70 percent of these corals died. These impacts have been attributed to the warmest ocean temperatures in 600 years. The repercussions of the 1998 event will be far-reaching in time and in economic impact.

It has also been estimated that 58 percent of the world's reefs are threatened by human activities, such as inappropriate coastal development and destructive fishing practices. As a result of these various pressures, coral reef habitats have been damaged and in some cases destroyed. Further, coral diseases are expanding rapidly. An example is one coral disease, black band disease, which also can be seen on this graph to my left. Like most of the diseases currently being studied, the causes are not widely understood.

These serious problems highlight the need for better conservation and improved management. Unfortunately, the United States has not been immune to these problems. We have large coral reef systems off the coast of Texas, Florida, Hawaii, and various U.S. territories in the Caribbean and the Pacific. These reefs produce significant economic benefits for their surrounding communities. In Senator Inouye's home State of Hawaii, for example, the reefs contribute approximately $1.13 billion annually to the State economy.

On March 25, 1999, I introduced along with Senator McCain, the full Committee Chairman, the Coral Reef Conservation Act of 1999, S. 725, as an attempt to remedy these serious problems. This bill is a realistic and responsible measure which addresses the most urgent coral reef conservation needs.

This bill authorizes $3.8 million in each of the next three fiscal years for a coral reef conservation program at NOAA. This program will provide conservation and research grants to States, U.S. territories, and qualified nongovernmental entities. Eligible projects will focus on the type of local conservation measures that have been called for by the international community of coral reef scientists and managers as part of the International Coral Reef Initiative's renewed call to action. This call is echoed in the U.S. Coral Reef Task Force's Islands Initiative.

The bill also authorizes NOAA to enter into an agreement with a qualified nongovernmental organization to create a coral reef trust fund that will match Federal funds with private contributions to provide additional money for worthy conservation and research projects. The public-private partnership envisioned by this bill will maximize Federal dollars and increase the overall funding of coral reef conservation projects in a responsible manner. This will help to ensure the longevity of any project and aid local entities in building the necessary capacity to carry out continued conservation efforts.

In addition, this bill authorizes $200,000 in each of the next three fiscal years for emergency assistance to address unforeseen or disaster-related problems pertaining to coral reefs, such as hurricanes and typhoons. One mechanism currently being used by the Federal Government to protect coral reefs and many other important marine resources is the national marine sanctuaries program. 100 years after the first national park was created, the U.S. made a similar commitment to preserving its valuable marine resources by establishing the national marine sanctuaries program in 1972.

Since then 12 areas covering a wide range of marine habitats have been designated as national marine sanctuaries. Again, on my left you can see in the chart the distribution of designated sanctuaries. Half of these designations have occurred in the last decade.

Today our marine sanctuaries encompass everything from marine mammal nursery grounds to underwater archaeological sites. Together these sanctuaries protect nearly 18,000 square miles of ocean waters, an area nearly the size of Vermont and New Hampshire combined.

Acting as a platform for better ocean stewardship, these sanctuaries offer an opportunity for research, outreach, and educational activities. These national marine sanctuaries are also a model for multiple use management in the marine environment. Obviously, balancing the protection of public resources with fostering economic activities requires the cooperative efforts of Federal, State, and local government, as well as nongovernmental organizations and the public. There are many of these partnerships working together within the national marine sanctuaries program.

One of these sanctuaries is located off the coast of Senator Kerry's State—good timing—of Massachusetts in the Gulf of Maine. The Stellwagen Bank National Marine Sanctuary Program provides feeding and nursery grounds for more than a dozen marine mammal species. This has led to the development of a thriving whale-watching tourist trade. The area also supports important commercial fisheries for lobster, bluefin tuna, cod, and others. Historic data also strongly suggest the presence of several shipwrecks within the sanctuaries.

Today commercial shipping lanes still exist through the sanctuary. Through careful management and cooperation, all of these diverse uses coexist in a national marine sanctuary while providing protection to the marine resources. This is just one example of the diverse management opportunities available within the system. I look forward to hearing of more examples this afternoon.

The National Marine Sanctuaries Act expires at the end of this current fiscal year. The 1999 reauthorization of the act, coupled with the Coral Reef Conservation Act, will provide a vision for marine resource protection that will shape policy decisions well into the next century.

We have assembled an excellent slate of witnesses to advise the committee on the best course of action. I am very pleased that all of you could be here today to tell us not only what needs to be done to protect the Nation's marine resources, but also the very serious costs that will result from not protecting them. I look forward to your testimony here today.

Senator Kerry.

Senator KERRY. I would be delighted to let Senator Stevens go if he wants to.

Senator SNOWE. Senator Stevens.

STATEMENT OF HON. TED STEVENS,
U.S. SENATOR FROM ALASKA

Senator STEVENS. No, thank you.

STATEMENT OF HON. JOHN F. KERRY,
U.S. SENATOR FROM MASSACHUSETTS

Senator KERRY. Well, Madam Chairwoman, thank you very much for having this hearing. I certainly welcome our representatives here to discuss this issue. I appreciate enormously your concern and the Committee's concern about this issue. Needless to say, all of us serve on this Committee because we are deeply committed to the linkage of our States to the ocean and to the water bodies that are linked to us.

For two of us, the Atlantic is our home. Both of our States, Maine and Massachusetts, and obviously the rest of our colleagues in the New England area, depend enormously on that linkage. Senator Stevens has the same concerns. His population has lived off the sea for years, and set a huge example for all of us about the connection between our States and the ocean. I know that he, as ranking member, as chairperson of the Subcommittee from time to time, and in his role on the Appropriations Committee, labors hard to assist us to put the appropriate resources where they ought to be.

This discussion today is part of a larger mosaic that concerns all of us: the overall protection that we are affording to the ecosystem within the ocean and the benefits that the ocean represents to us. The National Marine Sanctuaries Act itself is one component of that, and it provides a unique coastal habitat protection effort and encourages natural resource management. I think the Act has done this pretty competently and pretty effectively, though since the time when I was chairman of this subcommittee we have been fighting for resources. That has been the long fight.

This is not like some other programs that we fund. Although nearly all funding mistakes have measurable negative consequences, the negative consequences that come with our lack of sufficient effort with respect to habitat protection and living marine resource management are too often irreversible. The consequences of—anybody who is a neutral observer of the journey we are on cannot help but conclude that, rather than gaining ground as we think we ought to be, we are still losing ground.

We need to be deeply, deeply concerned about that. There are great examples, such as the lobster catch, the striped bass in Massachusetts, and other efforts, where we have really shut down, been smart, conserved, and brought back the capacity of the fish stocks.

However, there are other examples today where species are almost extinct or habitat is almost so destroyed, such as coral reefs and the dead zones down where our colleague from Louisiana comes from. I think these areas need greater focus.

We in Massachusetts are blessed to have about a million people a year come now to enjoy the Studds Stellwagen Bank National Marine Sanctuary, which sustains humpback whales, right whales, and commercial species. It has entered into a wonderful partnership with the New England Aquarium to enhance our understanding of those natural systems and to educate the public. That is the kind of partnership that I think we should be encouraging and leveraging on a broader basis.

We will hear today from Mike Connor about that, and we will realize the ways in which we have only just begun to really enjoy the benefits of this kind of education and resource protection.

As we have done with the sanctuary program, we are now also working to create a comprehensive program to protect the coral reefs. I want to congratulate both the chairwoman and Senator Inouye for the leadership that they have shown by advancing legislative proposals.

Each year the threats to our coral reefs increase from human choices, from population growth on our coasts, from expanding tourism, from runoff pollution, from destructive fishing, and now, according to the science that we are being provided with, from climate change. Evidence is mounting that the warming climate and the warming oceans are killing reefs, leaving them bleached and barren of the infinite biodiversity that they once supported.

Along with Senators Breaux and Hollings, I am pleased to be an original sponsor of the Coral Reef Protection Act of 1999. I think it will help create the kind of science-based restoration and preservation efforts that we need, and it encourages the partnership with a matching program with real money. I think the $20 million per year it provides, is the kind of significant investment that we need to make.

NOAA is already spending about $13 million for basic work on coral conservation, and we are told by the U.S. Coral Reef Task Force this is simply not enough.

It is my hope that we can all join together on a larger coastal protection act, and I hope very much that we can do that in the short term. I think we need a bipartisan, committee-broad approach in order to address these very significant issues that we face.

Thank you, Madam Chairwoman, for your indulgence and I look forward to the hearing today.

[The prepared statement of Senator Kerry follows:]

PREPARED STATEMENT OF HON. JOHN F. KERRY,
U.S. SENATOR FROM MASSACHUSETTS

Thank you Madam Chairwoman.

The legislation we are discussing today is a priority for my home state. After all, Massachusetts is inexorably linked to the ocean. The Atlantic is home to our fisheries, generates tourism, draws us for our summer vacations and connects us to our maritime history. I have also advocated for stronger protections for our oceans globally. Shortsighted development and pollution are destroying marine ecosystems—and I view the legislation we will discuss today as part of our nation's effort to protect the oceans worldwide.

To meet the challenge of coastal and ocean stewardship, Congress has tried to develop innovative programs for the long-term protection, conservation, utilization and management of our vulnerable marine resources. This includes the National Marine Sanctuaries Act.

The Sanctuary Program protects unique coastal habitat, marine biological diversity and fishery stocks, and it encourages natural resource management with appropriate recreational and commercial activities. It is not easy to balance the sometimes destructive results of economic growth and development with coastal stewardship, but I believe this program is a proven success at balancing conservation and public use. The recent compromise plan among user groups in the Tortugas 2000 Reserve is one example of this.

My complaint with the Sanctuaries program is that we have underfunded it. When I worked to reauthorize this program in 1996, we sought $45 million over three years to fund the management of the existing marine sanctuaries. Since that

reauthorization, the program has continued to demonstrate its effectiveness and value. I am fortunate to have watched this progress first hand in Massachusetts.

The Studds Stellwagen Bank National Marine Sanctuary sits just off the Massachusetts coast. It's a unique area that sustains humpback whales, right whales and commercial species. Each year, over 1 million people ride the whale watching boats to see these magnificent creatures closeup.

As we will hear today, the Stellwagen has partnered with the New England Aquarium to enhance our understanding of the sanctuary's natural systems and to educate the public. It is just the kind of public-private partnership we envisioned for this program and that I want to encourage across government.

However, the story of Stellwagen is more about potential than it is about past accomplishments.

As we will hear today from Mike Connor of the New England Aquarium, we have only begun to realize the benefits of the Sanctuary program in terms of education and resource protection. But we can only capture this potential if we are willing to make the investment of federal support.

I will soon introduce legislation called the Coastal Stewardship Act with Senators Hollings, Breaux, Inouye, Boxer and Feinstein. This comprehensive proposal includes authorization of $35 million per year for the Sanctuaries program. This will more than double the program's budget and is in line with proposed increases from the Clinton Administration and others. I strongly believe these additional resources are justified.

As we have done with the Sanctuary Program, this Committee is now working to create a comprehensive program to protect coral reefs. I want to congratulate both the Chairwoman and Senator Inouye for the leadership they have shown by advancing legislative proposals.

As with so many of our marine issues, we are in race to save our reefs. Each year the threats to our coral reefs increase from population growth on our coasts, expanding tourism, runoff pollution, destructive fishing and, now, the emerging threat of climate change is taking toll. Evidence is mounting that our warming climate and warming oceans are killing reefs, leaving them "bleached" of their color and barren of the almost infinite biodiversity they once supported.

Along with Senators Breaux and Hollings, I am an original cosponsor of Senator Inouye's proposal, the Coral Reef Protection Act of 1999. I believe it will create the kind of science-based restoration and preservation efforts we need. It also would extend funding to protect the deep water coral communities that support fisheries in place like the Gulf of Mexico and Georges Bank. Like the Sanctuary program, it encourages cooperation and partnerships with a matching program. And the $20 million per year it provides is the kind of significant investment we need to make in protecting these irreplaceable marine resources. Already, NOAA spends $13 million for basic work on coral reef conservation and the U.S. Coral Reef Task Force tells us this is not enough.

I have included Senator Inouye's proposal in my Coastal Stewardship Act because I want us to explore every avenue we can to get federal support for reef protection. In addition, the Coastal Stewardship Act has dedicated funding to reduce polluted runoff. Polluted runoff can choke reefs and, alone or in combination with other stresses, cause disease and other pathologies. We need to tackle that problem as well.

The unfortunate fact is that our oceans are dying. We are losing coral reefs and marine species. Harmful algae blooms and dead zones are becoming more common. And our commercial fisheries are in decline.

The Sanctuary program and this new reef initiative are some the best opportunities we have to restore and preserve marine habitat, to explore and understand ocean and coastal ecosystems, and to educated the public about the important role our oceans and coasts play in our environment and economy.

It is my hope that with the our earlier hearing on the Coastal Zone Management Act and this hearing today, with these new coral reef proposals, and with my Coastal Stewardship Act, we can find a way to reverse the destructive trend and start restoring and preserving our coastal and ocean environment.

I want thank the Chairwoman and I look forward to hearing from our witnesses.

Senator SNOWE. Thank you very much, Senator Kerry.

Senator Breaux, do you have any opening statement?

STATEMENT OF HON. JOHN B. BREAUX, U.S. SENATOR FROM LOUISIANA

Senator BREAUX. No. I ask that my full statement be included in the record at this time.

[The prepared statement of Senator Breaux follows:]

PREPARED STATEMENT OF HON. JOHN B. BREAUX, U.S. SENATOR FROM LOUISIANA

I want to thank Senator Snowe for holding this hearing and our panel of witnesses for joining us today.

The fact that this hearing is being held today is timely and I must admit somewhat coincidental. Just a few weeks ago while reading my *Yachting Magazine* (and dreaming of my next boat), I came across an article—*Who is Killing The Reefs of Florida?* As an avid recreational diver, I found the article not only interesting to read, but also disturbing.

When I read the words "scientists say a constant bombing of fresh water, very rich in nitrogen and phosphorous, is more than the coral can bear," I immediately thought of the legislation Senator Snowe and I sponsored last year, The Harmful Algal Bloom and Hypoxia Control Act (Dead Zone). The similarities being that nitrogen and phosphorous runoff believed to have created a 7,000 square mile dead zone in the Gulf of Mexico are also responsible for the degradation of coral reefs.

Equally important, I also thought of the United States' substantial coral reefs holdings, including the Flower Garden Banks on the Texas/Louisiana maritime border in the Gulf of Mexico (the northern most coral reefs in North America). I then thought what a tragedy it would be if our children and grandchildren did not have the same opportunities many of us have had.

These opportunities cover the gamut. Coral reefs are an essential source of food, jobs, recreation and revenue generated by fishing, tourism and research industries. It disturbs me to know that environmental studies indicate our nation's reefs continue to be threatened by pollution, over-fishing and severe climate changes.

I believe that the Coral Reef Protection Act of 1999 introduced by Senator Inouye and cosponsored by Senators Akaka, Kerry, Hollings, Boxer, Feinstein and myself establishes a comprehensive program to address this serious problem.

It would authorize appropriations totaling $100 million over a period of five years to preserve, sustain, and restore the health of U.S. coral reef ecosystems and assist in the conservation and protection of coral reefs by supporting conservation programs. Additionally, this legislation would leverage the federal dollars appropriated for these purposes by establishing a formal mechanism for collecting and allocating matching monetary donations from the private sector to be used for coral reef conservation projects. This authorization would support the President's Lands Legacy Initiative; the Coral Reef Task Force, established last year by Presidential Executive Order; the United States Coral Reef Initiative; and other ongoing efforts to ensure the long-term health and sustainability of coral reef ecosystems.

The Coral Reef Protection Act of 1999 would also authorize $15 million per year in grants to support coral reef and coral reef ecosystem conservation and restoration projects. Any relevant State or territorial natural resource management authority or other government authority with jurisdiction over coral reefs or coral reef ecosystems, or educational or non-governmental institutions with demonstrated expertise in the conservation of coral reefs would be eligible to apply for these grants, which would be administered by the Secretary of Commerce. Except for projects costing less than $25,000, or specific exemptions granted by the Secretary, these grants would be subject to a 25% non-federal matching requirement.

The answer to the question, "Who's killing the reefs?" is all of us, and until we do a better job working together, the end of our coral reef treasures is rapidly approaching.

I am prepared to travel to a Florida coral reef or other mutually agreeable reef site to witness first hand not only the beauty and tranquility of coral reefs and marine sanctuaries, but also the degradation caused by human influence and inteference.

In closing, I want to thank the Chair and witnesses again. I look forward to our discussion today and to working with the Committee in the coming months to pass this important legislation.

[The prepared statement of Senator Inouye and letters of support follow:]

STATEMENT OF HON. DANIEL K. INOUYE, U.S. SENATOR FROM HAWAII

Both of the subjects before us today, the protection and conservation of America's coral reef resources and reauthorization of the National Marine Sanctuaries Act, represent important opportunities to protect some of our country's richest natural treasures and to provide significant new resources which will support a new conservation vision for the 21st century. I believe that today's hearing will clearly demonstrate the importance of these programs and the need for much greater financial resources for a variety of activities including research, conservation, restoration and educational outreach.

With respect to coral reefs, I would like to thank Chairman Snowe for scheduling this hearing to discuss issues of importance to our national coral reef treasures, and in particular, to discuss S. 725, the Coral Reef Conservation Act, introduced by Senators Snowe and McCain, and S. 1253, the Coral Reef Protection Act, introduced on behalf of myself and Senators Akaka, Hollings, Kerry, Breaux, Boxer and Feinstein. I look forward to working with the members of this committee to develop the best possible mechanism for addressing the needs of our coral reef ecosystems.

It is very important to fully understand the importance of these fragile ecosystems. Coral reef ecosystems are the marine equivalent of tropical rain forests. They contain some of this planet's richest biological diversity, habitats, and systems and provide critical support to thousands of fish and other species. More than half of this country's commercial fisheries depend on coral reefs for some part of their life and the annual value of the commercial and recreational fisheries associated with coral reef ecosystems exceeds $200 million per year. In addition, these reef ecosystems support another $2 billion in tourism every year. Despite this importance to both the environment and the American economy, very little is currently known about the condition of coral reefs in the United States. Two points, however, are clear: coral reefs are threatened whenever they are close to large concentrations of people, and coral reefs are in decline.

In light of these threats, the economic importance of these ecosystems, and the as yet unknown promises of pharmaceuticals, food sources, and other benefits held within these diverse ecosystems, I have proposed, in S. 1253, the Coral Reef Protection Act of 1999, an authorization of $20 million per year for the next five years for research, conservation and restoration of these extremely valuable resources and to complement and support the efforts of the President's Coral Reef Task Force which was established by Executive Order last year. I firmly believe that this is the minimum amount necessary to address the critical problems facing U.S. coral reefs which have been identified by the U.S. Coral Reef Task Force; state, territorial, and local governments; scientists; industry groups; and other nongovernmental organizations; many of which have sent me persuasive letters and testimony urging the expeditious adoption of increased funding to address these threats, especially in the Pacific where more than 93% of these reefs exist.

Madam Chairman, I respectfully request unanimous consent to include these letters and testimony as part of the hearing record.

With respect to the National Marine Sanctuary Program, I fully support the reauthorization of this important program. The Hawaiian Islands National Marine Sanctuary Program is only 16 months old, but has exceeded all expectations through its comprehensive and innovative sanctuary awareness and educational outreach programs. This sanctuary has a large dedicated volunteer force and has forged successful public-private partnerships to enhance its activities and strengthen community support for the sanctuary.

Madam Chairman, I look forward to working with you and the other members of the Commerce Committee to address the pressing needs associated with coral reefs and marine sanctuaries.

June 28, 1999

The Honorable Daniel K. Inouye
United States Senate
722 Hart Senate Office Building
Washington, D.C. 20510-2201

Dear Senator Inouye:

The State of Hawaii fully supports Senate Bill 1253, the Coral Reef Protection Act of 1999. The livelihood of our island economy depends on the health of the coral reef ecosystem for everything from shoreline protection to receation and tourism. Hawaii is sorely under-funded in its ability to properly manage and conserve these coral reef resources, and we strongly encourage Congress to fully fund this Bill.

Over 80 percent of the coral reef resources within United States jurisdiction are found within Hawaiian waters. The State of Hawaii manages 1,500 miles of marine waters representing 410,000 acres of coral reef resources. The direct economic benefit derived from these resources is over $1 billion in gross revenues annually. Coral reefs create our sandy beaches, which are a visitor destination for people from around the world. Hawaii consistently ranks as one of the best places in the world for scuba diving. Maintaining the health of the coral reef ecosystem is vital to our way of life.

The State requests that Senate Bill 1253 be changed to allocate a specific portion of the funds to the States and Territories that have direct trustee responsibility for managing coral reefs. Allocation of a percentage of the funds to those State agencies with direct management responsibility for coral reef resources will assist the United States in preserving, sustaining, and where possible, restoring coral reef resources.

Thank you for the opportunity to provide these comments to the members of the Oceans and Fisheries Subcommittee on this critical piece of Legislation.

With warmest personal regards,

Aloha,

Benjamin J. Cayetano

June 28, 1999

Honorable Daniel K. Inouye
United States Senate
722 Hart Senate Office Building
Washington, D.C. 20510-2201

Dear Senator Inouye:

Thank you for the opportunity to provide written testimony on Senate Bill 1253, The Coral Reef Protection Act of 1999. The State of Hawai'i Department of Land and Natural Resources strongly encourages Congress to support and fully fund this Bill as these unique ecosystems are severely stressed and the States and Territories themselves are sorely underfunded in their ability to properly manage and preserve them.

The Department of Land and Natural Resources has statutory authority over management of all coral reef ecosystems within State waters, from the southernmost island of Hawaii up to Kure Atoll over 1,500 miles to the northwest. The coral reef ecosystems found within this large expanse constitute the majority of all U.S. reefs. It is the trustee responsibility of the Department of Land and Natural Resources to manage over 410,000 acres of coral reef that fall within this area. Hawaii's coral reefs are viewed as some of the most exceptional and beautiful aquatic environments on the planet; our fringing reefs alone abound with more than 5,000 different known species of spectacular and incredibly diverse marine plants and animals—many of which are uniquely Hawaiian and found nowhere else on earth. We sincerely appreciate the opportunity to comment on this Bill and offer the following suggestions:

1. The primary function of S. 1253 is to preserve, sustain and restore U.S. coral reef ecosystems. Given that the majority of all U.S. coral reefs lie within State and Territorial waters and that the agencies responsible for, engaged in, and directly accountable for those coral reef resources are the states' and territorial natural resource management agencies these agencies should lead in implementing the purposes of this Bill. We would like to suggest that a minimum of 20% of the funds allocated for this Bill should be provided to assist the seven (Hawaii, Florida, American Samoa, CNMI, Guam, Puerto Rico and the U.S. Virgin Islands) state and territorial natural resource management agencies with direct trustee responsibilities for coral reef ecosystems. Use of these funds should go through a similar review process as suggested under Section 6 of this Bill.

2. Given the critical importance of these unique ecosystems to the economy, tourism, shoreline protection, fisheries (over 50% of U.S. commercial fisheries spend a portion of their life cycle associated with coral reefs), future biomedical and pharmaceutical advances, recreation and native cultural practices, we strongly encourage full funding of this Bill. Funding should be used in order to assist the States and Territories with managing the increasing complexity of overlapping uses and impacts occurring on these ecosystems and to protect these national treasures at a time when coral reefs as ecosystems are becoming increasingly threatened worldwide. Examples of immediate funding needs include mapping of coral reef resources, Statewide long-term monitoring of coral reef ecosystems, protection of key reef re-

sources, and program development to deal with alien species, nutrification, and overfishing.

Thank you for the opportunity to provide comments on this very important piece of legislation, The people of Hawaii sincerely thank the members of the Oceans and Fisheries Subcommittee for their efforts to help us protect our coral reef resources and ecosystems.

Aloha,

Timothy E. Johns

June 28, 1999

Serial: 846

The Honorable Daniel K. Inouye
United States Senate
Washington, D.C. 20510

Re: Coral Reef Protection Act of 1999

Dear Senator Inouye:

It is with great pleasure to hear about your introduction of the S. 1253, Coral Reef Protection Act of 1999. In the wake of the US Senate's lamentable deletion of the Presidents proposed Lands Legacy Act, American Samoa is very fortunate to have a champion like you whom the region can count on for legislative support, I am writing to express my support of your efforts to secure federal commitment towards the protection and preservation of the coral reefs ecosystem. I was also very pleased to read Section 9, concerning certain vessels, which addresses our longliner issue, which, as you know, has been a top priority of mine.

American Samoa along with its Insular Areas counterparts has worked hard to promote the US Coral Reefs Initiative ever since the announcement was first made in the early 90's, To that end, the Insular Area developed an Action Plan that was endorsed for phority funding by the President's CRI Task Force in February, 1999, at its annual meeting in Maui. Following the Maui Meeting, the Insular Area was tasked by the Task Force to update its priorities and have it submitted in July's meeting in San Diego. This has continued in spite of the lack of any federal appropriations to the Insular Area.

Our own local Coral Reef Task Force has been working to designate projects vital to the protection of our coral reef resources, they recently concluded a three-day workshop developing a five-year research and monitoring plan for the Territory. The cooperation between local and federal agencies here insured a well-crafted plan, which will be presented at the next US Coral Reef Task Force Meeting. However, many of the crucial elements of the plan depend upon financial commitment from the Federal Government. We hope that with your efforts on this proposed legislation we will be able to carry out our local priorities.

In general, the proposed legislation is very comprehensive and we just want to offer some minor suggestions.

1. Under Criteria for Approval (2g): replace the word "port" and "ports" on the second line with the word "part".
2. Under SECTION 6 subsection (l) Technical Assistant: insert the word "Territory" following State.

You have my full support and if there is anything we in American Samoa can do to assist, please don't hesitate to call on me or Mr. Lelei Peau, American Samoa's CRI Point of Contact.

Sincerely

Tauese P.F. Sunia

Governor of American Samoa

June 25, 1999

The Honorable Daniel K. Inouye
United States Senate
Washington, DC 20510

Dear Senator Inouye

We were pleased to hear of the introduction of S. 1253, *Coral Reef Protection Act of 1999*. With the deletion of funding for coral reefs under the President's Lands Legacy Act, it becomes even more imperative that action be taken to provide guid-

ance and funding for the management, intelligent exploitation, conservation and preservation of these extremely productive and fragile resources.

For those of us who live at the edge of coral reefs, it is all too apparent that our reefs are in immediate danger, not only from the daily activities associated with shoreline or island communities, but from the long term and large scale problems of climate change as well. If we do nothing, as we have to this point, we will lose not only billions of dollars in commerce associated with healthy reefs, but we will lose the ability to live in island environments as well.

Your bill is a very good start toward addressing the problems that face us. Thus far, since the adoption of the U.S. Coral Reef initiative in 1994, considerably less than one million dollars has been appropriated directly applicable to the policies of that Initiative. Guam has received a total of fifty two thousand dollars ($52,000) in that five year period, although we also received another one hundred fifty thousand dollars ($150,000) for emergency reef clean up after Supertyphoon Paka. The funding allocated thus far is not indicative of a nation committed to resource protection and management.

In way of specific comment, we would draw your attention, in Section 5 (Definitions), the definition of "State". In order to bring this definition in line with the intent and title of the bill, we recommend the addition of the words *reef building* before the word "coral", so that the definition would read.

State: The term "State" means any coastal State of the United States that contains reef building coral within its seaward boundaries, and American Samoa. Guam, The Northern Mariana Islands, Puerto Rico. and the U.S. Virgin Islands, and any other commonwealth, territory, or possession of the United States that contains reef building coral within its seaward boundries.

I fully support the intent of your legislation, and applaud you for taking this initiative. If I can be of any further assistance in achieving legislation that helps us preserve this invaluable resource fbr future generations, please do not hesitate to contact me.

Very truly yours,

Carl T. C. Gutierrez

Governor of Guam

June 25, 1999

The Honorable Daniel K. Inouye
Member, Oceans and Fisheries Subcommittee
Committee on Commerce, Science, and Transportation
United States Senate
SH-428 Hart Senate Office Building
Washington. DC 20510

Dear Senator Inouye:

Re: S. 1253, Coral Reef Protection Act of 1999

Thank you for the opportunity to comment on S. 1253, the Coral Reef Protection Act of 1999. The Commonwealth of the Northern Mariana Islands (CNMI) contains some of the most biologically diverse and pristine reefs amongst the American Pacific Islands. These reefs are not only culturally significant, but provide a source of food, storm protection and sustain our tourism industry.

The Asian economic crisis has significantly affected the economy of the CNMI, and there are insufficient funds available to adequately protect our reefs. The CNMI fully supports the intent and funding level requested in the Coral Reef Protection Act of 1999 and feels passage of the bill is critical if we are to move forward in coral reef protection. The funding level specified in the bill would allow the CNMI and other Pacific islands the means to initiate, develop, and implement management plans to monitor and protect coral reefs in the Pacific.

Preservation and protection of the coral reefs under U.S. Jurisdiction is a meaningful and essential task if we are to pass these beautiful and irreplaceable resources to the next generation. I commend you and your colleagues for your vision and support of the Coral Reef Protection Act of 1999. I pray you are able to draw the necessary support to pass this crucial bill.

Please let me know if you would like additional information from us. Again, thank you for the opportunity to comment on this vital bill.

Sincerely,

Pedro P. Tenorio

June 28, 1999

Hon. Daniel K. Inouye
U.S. Senate
722 Hart Senate Office Building
Washington, DC 20510

Dear Senator Inouye:

I write in support of your bill, S. 1253, authorizing funding for the conservation of coral reefs.

I was born in a village that existed where it did because of the existence of a sheltering coral reef. The subsistence economy of the people in my village was largely dependent upon the fish which flourished on the reef and within the reef-ringed lagoon. So, I have a special feeling for and understanding of the beauty, the utility, and the geographic magnificence of this unique life form, the coral reef.

But coral is not simply a thing of beauty and a quaint reminder of past ways of life. The mainstay of the Northern Marianas economy is tourism. And without the 15 miles of protected sandy beach and placid waters which the reef provides, it is safe to say we would have little of the tourism-related development we have on our principal island, Saipan.

Without the reef Saipan would not have a naturally protected port in which the container ships and fuel vessels that feed our economy can safely conduct their business. Our other populated islands, Rota and Tinian, are clearly hampered in their development because of the incredible expense involved in creating breakwaters sufficient to hold back the open ocean, something the reef does for Saipan for free.

As can happen with natural cycles and scales of activity that dwarf our human life spans and ability to comprehend, the reefs of the Northern Marianas have not always been treated with respect. While the days of chlorine and dynamite fishing are behind us and the obvious destruction they caused the reef, more subtle forms of disturbance now trouble the relationship between island-dwelling people and these great communities of life which lie offshore. The run-off from the land we strip of vegetation as we build, the pollutants seeping into the ocean which grow as our populations grow, the physical destruction that comes from collectors of coral or ships run aground—all these factors exact their toll. Forces largely beyond our local control, too—global warming and the attendant rise in sea level—eat away at the vitality of our coral reefs.

Thus, your bill is most welcome—as have been the previous acts of Congress focusing attention on the coral reef and setting policy for conservation. I cannot express too strongly my support for your initiative; and I offer to assist in any way I can to see S. 1253 through to enactment.

Sincerely,

Juan N. Babauta

Resident Representative

June 28, 1999

Honorable Daniel K. Inouye
U.S. Senator
722 Hart Senate Office Building
Washington, D.C. 20510

Dear Senator Inouye:

Thank you for providing the Western Pacific Fishery Management Council an opportunity to provide testimony in support of the "Coral Reef Protection Act of 1999".

Roughly 70% of the world's coral reef are found in the Pacific Ocean. Moreover, of the total amount of coral reefs under US jurisdiction, over 90% are located in the Pacific region. While it is believed that most of these reefs are generally in good condition, large gaps exist in our current knowledge of the total extent and health of the coral reef ecosystems found in the Pacific. Many of the coral reef resources under US jurisdiction have never been surveyed or even assessed.

There are numerous man-induced and natural threats to the continued health of coral reefs including excessive resource exploitation, sedimentation, marine debris, major storms and global climate change. A serious and growing threat in the central western Pacific is the live reef-fish trade, estimated to be a $1.2 billion-dollar a year business based in Hong Kong. In 1996, live giant groupers reportedly sold for $11,000 each. As Chinese demand for live reef-fish continues to grow, and many foreign reefs are now denuded of prime specimens, Asian fishermen continue to move eastward, and are now on the verge of threatening US reefs in the central and west-

ern Pacific. The vastness of the region, combined with the remoteness of the atolls and small islands make Pacific coral reefs highly susceptible to "hit and run" illegal fishing operations conducted by rogue foreign fishing vessels. The level of surveillance and enforcement activities necessary to identify and apprehend these operations requires considerable resources. Compounding these concerns is the fact that the use of coral reef resources in federal waters is largely unregulated at present. Regulations to sustainably use and protect reefs are needed in US federal waters of the Pacific.

Fundamental to the management and protection of the region's coral reef ecosystems is the need to assess the health of coral reefs in the Pacific, map coral reef ecosystems, and monitor the health and threats that impactreefs. Bridging the gaps in knowledge of the these complex ecosystems will require a concerted and sustained effort on the part of the federal, state, territorial and local governments, in partnership with local communities and NGOs, to manage, protect and preserve these biologically rich and diverse resources,

The Western Pacific Fishery Council is currently developing a fishery management plan (FMP) for coral reef ecosystems that will be implemented next year. The management plan will establish a permit and reporting requirement for sustainable harvest of reef resources, ban destructive fishing methods, establish marine protected reef areas, minimize adverse impacts to reefs, and establish a mechanism for flexibility to rapidly add new management measures. The FMP intends to ensure that the long-term economic benefits of coral reef resources are realized. However, effective implementation, together with all collaborating agencies and organizations, with require adequate funding which the "Coral Reef Protection Act of 1999" can help provide.

Sufficient resources are urgently needed to better understand, protect and manage our valuable reef resources, and effectively address the President's Executive Order on Coral Reefs. The following budgetary needs for Pacific coral reefs have been estimated for the next five years: $20 million for mapping and habitat assessment, $10 million for enforcement, $10 million for reef monitoring, restoration and emergency response, $10 million for assessment and removal of marine debris in the Northwestern Hawaiian Islands, $5 million for research, $5 million for the establishment of Marine Protected Areas (MPAs), $4 million for education and public awareness programs, and $3 million for proposed projects to protect coral reefs under the US Islands Coral Reef Initiative. Please use all power within your means to ensure successful passage of the "Coral Reef Protection Act of 1999" at $20 million per year. Mahalo!

Sincerely,

Kitty M. Simonds

Executive Director

June 28, 1999

The Honorable Daniel K. Inouye
United States Senator
722 Hart Senate Office Building
Washington, D.C. 20510

Dear Senator Inouye:

The coral-reef resources of the western Pacific, including those in Hawaii and other U.S. affiliated territories, are of great economic value, both in goods and services. In the State of Hawaii alone, coral reefs generate more than $797 million per year (1998) through the marine tourism industry (7,000 employees) and another $20 million a year in fisheries landing. Admission tees into Hanauma Bay coral-reef park bring $2.6 million annually, with another hundred thousand per month in concessionaire fees. Coral-reef fishes caught for the aquarium trade in Hawaii bring in another $800—$900 thousand annually. The coral reefs of Guam, a small U.S. island with 150 thousand residents, provide about $149 million per year from scuba-diving tourists. Palau, a U.S. affiliated island with only about 14,000 residents, obtained about $7,000 per day ($2.5 million per year) from the Blue Corner dive site alone in 1992. The total income from tourists in Palau in 1992 was $13 niillion and has increased in recent years. Nearly all tourist to Palau conic to dive on the coral reefs.

With the wide-spread depletion of nearshore fisheries resources in S.E. Asia, the value of the live-fish trade from coral reefs has increased to over $1 billion per year. Red grouper *(Epinephelus akaara)* and spotted grouper *(Plectropomus spp.)* currently sell for $42/kg. The Napoleon wrasse *(Cheilinus undulatus)* sells for $180/ kg,

and the lips have been served in Hong Kong for US $225. One grouper was purchased in Hong Kong for US $10,256 (South China Morning Post, 28 November 1996). Seahorses sell for US $850/kg as aphrodisiacs and other medicinal purposes. Live fish for the aquarium trade now provides $200 million per year for the Philippines.

The increased value of coral-reef resources and their depletion in S.E. Asia has compelled the Asian fishermen to exploit resources in U.S. affiliated areas. Just last week, 50 metric tons of live reef fish were taken from the Marshall Islands for Hong Kong restaurants. There have been economic interests expressed to National Marine Fisheries Service for exploitation of Palmyra Atoll, a U.S. territory without any regulations or management plan. The Northwest Hawaiian islands coral reefs have been damaged by over 15 tons of drift net debris, Live-rock harvesters from Florida have inquired about operating in U.S. Pacific waters.

Coral-reef resources are very productive, but need to be rationally and carefully managed because the time required to affect a reef or reef resources is short compared to the time required for recovery. A pinnacle off Guam was discovered and fished down in 6 months in 1967, but the fish are still not back after 32 years. A spawning aggregation of groupers was extracted from Denges Channel in Palau by Taiwanese in 1986 and has still not returned after 13 years. Black-lipped pearl oysters were harvested on Pearl and Hermes Reefs in the NW Hawaiian Islands in the 1920s, but subsequent and recent surveys have shown that the oysters have still not recovered after more than 70 years. The fastest recovery was 15 years for the corals to return to the state they were in on Guam at the time of a crown-of-thorns starfish attack in 1968.

Economically valuable resources of coral reefs are very productive if managed properly, but if not managed, millions per year are lost for decades if not forever. When overharvested, spawning aggregations of groupers and other resources do not recover for decades, if ever. Overharvesting of herbivores has led to ecosystem-level effects, i.e., permanent shift from coral to algae (e.g., Ngederrak Reef in Palau). We need to develop methods for management of broodstock, for understanding the complexities of the coral-reef ecosystem, and for replenishment of fisheries.

Without the Coral Reef Protection Act of 1999, there is simply not the financial support available to effectively manage the economically viable and sustainable use of coral-reef resources in the western Pacific, and for educating the public in the wise use of coral-reef resources. It is critical that we take effective action now. This Act will provide the means to do so.

Respectfully submitted,

Charles Birkeland

Professor

University of Guam

NATIONAL CORAL REEF INSTITUTE

May 10, 1999

The Honorable Daniel K. Inouye
Senate Appropriations Committee
United States Senate
Washington, DC 20510

Dear Senator Inouye:

Enclosed please find an Open Letter signed by 144 coral reef scientists, resource managers and conservationists, including at least one of your constituents, in support of Congressional appropriation of the $17.2 million requested in new funding in the President's FY 2000 budget to strengthen U.S. federal, state, territory, and commonwealth efforts **to protect and sustainably use the nation's valuable coral reefs.**

This includes $12 million in new funds requested by the National Oceanic and Atmospheric Administration (NOAA), Department of Commerce, and $5.2 million for the Department of the Interior for:

- Restoration, emergency response, mapping, monitoring, research and management capabilities for the National Ocean Service
- Increased protection, research and monitoring in management areas for the Fish and Wildlife Service
- Implementation of monitoring, restoration and protection measures in managed areas for the National Park Service

• Mapping, monitoring and research into causes of reef decline for the U. S. Geological Survey
• Assistance to territories for coral protection and management for the Office of Insular Affairs

Open Letter signatories participated in the National Coral Reef Institute (NCRI)-organized **International Conference on Scientific Aspects of Coral Reef Assessment, Monitoring, and Restoration,** held April 14, 15, & 16, 1999 in Ft. Lauderdale. The major outcomes of the Conference (listed on the web at http://www.nova.edu/ocean/ncri/ncri—pos.html) closely correlate with the goals of the Open Letter.

On behalf of all of the signatories, thank you for your time and attention to this matter.

Sincerely,

RICHARD E. DODGE
Executive Director

OPEN LETTER

TO: Members of Congress, President Clinton, and heads of federal agencies involved in the U. S. Coral Reef Task Force and the Governors on the U.S. Coral Reef Task Force.

FROM: Members of the coral reef science and management community in attendance at the *International Conference on Scientific Aspects of Coral Reef Assessment, Monitoring, and Restoration* as listed below.

It is widely accepted that coral reefs are extremely valuable (biologically, economically, and culturally). It is equally well understood that coral reefs, both nationally and globally, are in grave danger due to interactions and combinations of a wide range of human and natural impacts. Therefore:

Additional efforts are needed

(1) to understand the nature and function of coral reef ecosystems,
(2) to reduce human impacts at all scales,
(3) to best manage and protect reef ecosystems, and
(4) to anticipate and react to long-term, large-scale chance in the natural environment.

To this end:

We support the Executive Order #13089 on coral reef protections that established the US CRTF (Coral Reef Task Force) and their actions to date.
• We support Congressional appropriation of the $17.2 million new funding in FY 2000 request to strengthen US federal, state, territory, and commonwealth efforts to protect and sustainably use the nation's valuable coral reefs.

(continue to signature pages)

	Signature	Printed Name	Affiliation
1		STEUART H WOLFE	FLORIDA DEPT ENVIRON. PROT.
2		CHRIS PETREE	NSU
3		James Jeansonne	NOAA
4		Stephanie Varis	NCRI
5		Kameron Pegg	NOAA Oceanography
6		Phillip Sollins	Oregon State University
7		Emily Schmitt	The Nature Conservancy
8		Richard Dodge	NCRI
9		Dawn Miller	NCRI
10		Susan Teel	NSU
11		Thomas Maher	Dept. of Env. Protection - FL
12		Scott M. Taylor	The University of Tampa
13		Clive R. Wilkinson	Australian Institute of Marine Science
14		Bassett MAGUIRE	Univ. of Texas
15		Robert W. Buddemeier	Univ. of Kansas
16		DIRK PETERSEN	UNIVERSITY OF AKUREYRI
17		Andy Cabocvero	Marine Park Supt Marathon FL
18		Mary G. Gleason	Tetra Tech EM, Inc.
19		SANDRA L. BROWARD	Univ. of Miami Marine Lab
20		Joseph Schittone	Univ. of Miami / RSMAS
21		WALTER C JAAP	Fla. Marine Research Inst
22		GINGER GARRISON	Biol. Res. Div. USGS
23		W. RANDY BROOKS	Fla. Atlantic Univ.
24		CLAYTON B. COCK	Harbor Branch Oceanographic Inst.
25		Laurie Raymundo	Cornell University

	Signature	Printed Name	Affiliation
26		L.G. ELDREDGE	BISHOP MUSEUM, HONOLULU
27		Scott A. Heckel	NWA Southeastern University Oceanography
28		Elizabeth A. Chornesky	TNC
29		Charles M. Wahle	NOAA
30		Lisa Symons	NOAA
31		Peter J. Barile	Florida Tech
32		Brian Tissot	Washington State University
33		Larry Beggs	Reef Ball Foundation
34		Leanne Welch	Miami-Dade County DERM
35		Stephen Blair	Dade Co. DERM.
36		Ali Senauer	NOAA
37		MARK HIXON	OREGON STATE UNIV.
38		Stephen E. Thompson	" " "
39		TIFFANY LEDESMA	U PENN
40		DAVID GRIFFIN	NSUOC NCRI
41		Antonio L. Ortiz	U.P.R. Mayaguez Campus
42		DARIA SICILIANO	University of California, Santa Cruz
43		KEVIN HELMLE	Univ. Of Houston
44		Austin Bowden-Kerby	Counterpart/FSP INTERNATIONAL
45		James D. Thomas	NCRI
46		Carl R Beaver	Texas A&M University
47		Susan White	USFWS
48		JOAN MILLER	USGS
49		Eric P. Eisenhardt	Univ. of Washington
50		James C. Hendee	NOAA, US Dep. Commerce
51		ROGER GRIFFIS	NOAA, US DEPT. COMMERCE

	Signature	Printed Name	Affiliation
52	Robert B Jonas	Robert B Jonas	George Mason Univ.
53	Marie G. Korba	Marie G. Korba	EAS Engineering
54	Craig Lilyestrom	Craig Lilyestrom	Puerto Rico DNER
55	[illegible]	JOANNA PITT	Bermuda Biological Station
56	Deborah Gochfeld	Deborah Gochfeld	Univ. of Mississippi
57	Allison King Holzhausen	Allison King Holzhausen	PBC DERM
58	[illegible]	Richard S. Nemeth	Univ. Virgin Islands.
59	[illegible]	Juan L. Torres	Univ. of Puerto Rico
60	Michael [illegible]	MICHAEL SAMWAYS	UNIVERSITY OF NATAL, SOUTH AFRICA
61	Aaron Adams	Aaron Adams	Univ. Massachusetts Boston
62	Jennifer Orlowski	Jennifer Orlowski	USGS – ORD
63	Michael Brill	Michael Brill	University of Charleston, SC
64	MikeDowgiallo	Mike Dowgiallo	NOAA
65	David K. Stout	David K. Stout	BROWARD COUNTY DPEP
66	C. Renée Cooper	C. Renée Cooper	Caribbean Marine Research Center
67	John Marr	John Marr	Caribbean Marine Research Center
68	Linda A. Roy	LINDA A. ROY	ECKERD COLLEGE
69	Helen E Fox	Helen E Fox	University of California, Berkeley
70	[illegible]	Pamela L Kylstra	Oregon State University
71	Paulette Peckol	Paulette Peckol	Smith College
72	[illegible]	Christopher M. Mattie	St. Mary's College of Maryland.
73	Amelia von Gohren	Amelia F. von Gohren	St. Mary's College of Maryland
74	John W. Iliff	John W. Iliff	NOAA / Habitat Restoration Cntr.
75	[illegible]	Rebecca L. Vidra	UNC-Chapel Hill
76	Robert K. Cowen	ROBERT K. COWEN	Univ of Miami, RSMAS.
77	[illegible]	DAVID PALANDRO	UNIV. of So FLORIDA

	Signature	Printed Name	Affiliation
78	John P. Ebersole	John P. Ebersole	Univ of Mass Boston
79	Jody Simonds	Jody Simonds	Nova Southeastern Univ.
80	Jillian S. Morrow	Jillian S. Morrow	Nova Southeastern U.
81	[illegible]	Douglas Grosso	Nova Southeastern University
82	[illegible]	Brian Ettinger	Nova Southeastern University
83	Carol R Fretwell	Carol R. Fretwell	National Coral Reef Institute
84	Alexander Stone	ALEXANDER STONE	ReefKeeper International
85	Joel Stake	Joel Stake	Univ Southwestern Louisiana
86	Lamont C. Hempel	Lamont C. Hempel	Claremont Graduate University
87	Georgina Bustamante	Georgina Bustamante	The Nature Conservancy
88	Richard B. Aronson	Richard B. Aronson	Dauphin Island Sea Lab, Alabama
89	[illegible]	THADDEUS J T MURDOCH	Dauphin Island Sea Lab AL
90	Nikki Chapman	NIKKI CHAPMAN	Univ. of East London, England
91	William A. Tyler III	William A. Tyler III	Sanctuary Association
92	[illegible]	Carrie Manfrino Kiernan	Marine Environmental Research Inst.
93	Anita S. May	Anita S. May	University of Miami, RSMAS
94	George Garrett	George Garrett	Monroe County, Florida
95	Heike Vatodel Beeler	Heike Görödel-Beeler	RSMAS-MBF, University of Miami
96	Nichole Gusman	NICHOLE GUSMAN	RSMAS
97	[illegible]	Shay Viehman	FL. International Univ.
98	Sally Shearouse	Sally Shearouse	FL Institute of Technology
99	Terry Snell	Terry Snell	Ga. Institute of Technology
100	[illegible]	JAMES M CERVINO	Univ. of South Carolina
101	Anthony R. Picciolo	Anthony R. Picciolo	NOAA / DOC
102	[illegible]	STEPHEN COLWELL	The Coral Reef Alliance
103	Barbara A. Best	Barbara A. Best	US. Agency for International Development

	Signature	Printed Name	Affiliation
104	[illegible]	John Bruno	Brown University
105	[illegible]	Brian Walker	Nova Southeastern U.
106	[illegible]	DONALD POTTS	UNIVERSITY CALIFORNIA, SANTA CRUZ
107	[illegible]	Lillian C. Becker	FLORIDA INTERNATIONAL UNIVERSITY
108	[illegible]	Amy L. Paine	Nova Southeastern University Oceanographic C.
109	T. J. Done	TERENCE DONE	AUSTRALIAN INSTITUTE OF MARINE SCIENCE
110	[illegible]	MICHAEL NOAH	PLANTALIA OCEAN SCIENCES, INC
111	[illegible]	ERNESTO WEIL	UNIV. OF PUERTO RICO
112	[illegible]	Christy Semmens	Reef Environmental Education Foundation
113	Daniel Clark	Daniel Clark	South Florida Reef Research Team
114	[illegible]	MIKE GOODSON	UNIVERSITY OF YORK, ENGLAND
115	R. C. Murphy	Richard Murphy	Jean-Michel Cousteau Inst.
116	Michael P. Hamnett	Michael P. Hamnett	University of Hawaii/Pac Basin Dev. Cn.
117	[illegible]	Benjamin Haskell	Florida Keys National Marine Sanctuary
118	[illegible]	Benjamin L. Richards	NOAA Florida Keys National Marine Sanctuary
119	David Z. McMahon	DAVID Z. MCMAHON	Nova Southeastern University
120	Will Connelly	WILL CONNELLY	NOVA SOUTHEASTERN UNIVERSITY
121	David Gutierrez	DAVID GUTIERREZ	INSTITUTO NACIONAL DE ECOLOGIA
122	[illegible]	CRAIG DAHLGREN	Center for Marine Conservation
123	[illegible]	Deborah L. Santavy	US EPA
124	[illegible]	RICHARD KLAUBERMAN	FUHRMAN DIVERSIFIED, INC
125	[illegible]	Andrea Vogel	University of California at S.D
126	Pamela Fletcher	PAMELA FLETCHER	MONROE COUNTY
127	Kenneth Banks	Kenneth Banks	Broward County DNRP, Florida
128	Sheila McKenna	Sheila McKenna	Marine Lab UOG Mangilao, Guam
129	I. B. Kuffner	ILSA B. KUFFNER	HAWAII INSTITUTE OF MARINE BIOLOGY

	Signature	Printed Name	Affilation
130	Charles Birkeland	CHARLES BIRKELAND	Marine Lab, University of Guam
131	[illegible]	Stephanie Pravato	Cry of The Water, Reefkeeper
132	[illegible]	Germán R. Mendez	Nova Oceanographic Center
133	Katherine A. Hardy	Katherine A. Hardy	Western Washington University
134	Bob Gore	Bob Gore	NSU
135	Deborah Danaher	Deborah Danaher	Center for Marine Conservation
136	Esther C. Peters	Esther C. Peters	Tetra Tech, Inc.
137	Delisse M. Ortiz	Delisse M. Ortiz	University of Puerto Rico
138	Charles G. Messing	Charles G. Messing	Nova Southeastern Univ.
139	[illegible]	MAHMOOD S. SHIVJI	NOVA SOUTHEASTERN UNIV.
140	[illegible]	WILLIAM F. PRECHT	LAW Engineering & Environ. Serv. Inc
141	[illegible]	Lance K. B. Jordan	Nova Southeastern Univ.
142	Kevin Kohler	KEVIN KOHLER	NOVA SOUTHEASTERN UNIV
143	Margaret A Strumski	MARGARET A. STRUMSKI	NOVA SOUTHEASTERN UNIV
144	[illegible]	BART BACA	"
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June 24, 1999

Kitty Simonds
Executive Director
Western Pacific Fisheries Management Council
1164 Bishop Street, suite 1400
Honolulu, Hawaii 96813

Dear Kitty,

This letter is to offer support to your effort in assisting Senator Inouve support his bill in the US Congress entitled "The Coral Reef Protection Act of 1999." As you are well aware, coral reefs in the Pacific are increasingly threatened by burgeoning human population growth in the region. For example, increasing pressure from a variety of extractive fisheries in the major Hawaiian Islands has reduced the biomass of reef fish standing crops by about 80-90%. What this means is that many reefs in Hawaii are virtually barren of fish. We also have a variety of pollution problems that have degraded the health of reefs in Hawaii and the US Pacific Islands. These problems range from bleaching events, to starfish *(Acanthaster planci)* infestations, to degradation caused by excessive run-off of land born sediments which end up clogging some reefs. Marine debris (lost fishing nets, etc.) is another problem of increasing significance reported to be wreaking havoc, in some areas, such as the Northwestern Hawaiian Islands. Funding for protection and restoration of coral reefs in the US Western Pacific is urgently needed.

In Hawaii alone, the value of marine eco-tourism has been estimated at $750 million annually. This industry is vitally dependent on the health of the reefs for its sustainability. Improved management in the form of strengthened enforcement of fisheries regulations, more marine protected areas, the creation of more artificial reefs protected from fishing, fish stocking research, and pollution mitigation efforts, are subjects in immediate need of research support. Taking a longer view, coral reefs are also important in providing protection from storm erosion and mitigating the threat of rising sea level in many island communities. Defeat of Senator Inouye's bill would be a serious setback to any hope of solving many of these problems. It is in the vital interest of Hawaii and the US Pacific Islands that "The Coral Reef Protection Act of 1999" receive the support it needs for passage. Thank you for adding your support to this worthy cause.

Richard W. Grigg

Professor of Oceanography

Senator SNOWE. We will start with Ms. Sally Yozell, who is the Deputy Assistant Secretary of Commerce for Oceans and Atmosphere. Ms. Yozell has been actively involved with the U.S. Coral Reef Task Force. I know this is your first time testifying before the Subcommittee and we certainly appreciate that you could be here today.

Ms. Yozell, you can summarize your testimony and we will include your entire statement in the record. Please proceed.

STATEMENT OF SALLY YOZELL, DEPUTY ASSISTANT SECRETARY FOR OCEANS AND ATMOSPHERE, DEPARTMENT OF COMMERCE ACCOMPANIED BY: MICHAEL P. CROSBY, PH.D., SCIENCE ADVISORY BOARD, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, U.S. DEPARTMENT OF COMMERCE; AND ED LINDELOF, ACTING MANAGER, GERRY E. STUDDS STELLWAGEN BANK NATIONAL MARINE SANCTUARY, NOAA

Ms. YOZELL. Thank you, Madam Chair. Good afternoon.

My name is Sally Yozell. I am the Deputy Assistant Secretary for Oceans and Atmosphere at U.S. Department of Commerce, and I thank you for this opportunity to testify today on the coral reef legislation and the national marine sanctuaries program.

I am accompanied today by Dr. Michael Crosby, who is one of our coral experts at NOAA; and I want to, if I could, insert my statement into the record at this time.

Senator SNOWE. Without objection, so ordered.

[The prepared statement of Ms. Yozell follows:]

PREPARED STATEMENT OF SALLY YOZELL, DEPUTY ASSISTANT SECRETARY FOR OCEANS AND ATMOSPHERE, U.S. DEPARTMENT OF COMMERCE

INTRODUCTION

Good afternoon, Madame Chair and members of the Subcommittee. My name is Sally Yozell and I am the Deputy Assistant Secretary for Oceans and Atmosphere for the National Oceanic and Atmospheric Administration (NOAA). I would like to thank you for the opportunity to testify today on the Administration's proposal to reauthorize the National Marine Sanctuaries Act (NMSA), and on legislation to protect our coral reefs. Both the National Marine Sanctuaries Preservation Act of 1999 and Senator Snowe's and Senator Inouye's coral reef bills will further our ability to protect our National marine treasures. We at NOAA appreciate the interest in, and strong support for, the National Marine Sanctuary (NMS) System and coral reefs demonstrated by the Committee Members. First, I will discuss the reauthorization of the NMSA and then will address coral reef protection issues as reflected in S. 725, the Coral Reef Conservation Act of 1999, and S. 1253, the Coral Reef Protection Act of 1999.

NATIONAL MARINE SANCTUARIES

In 1972, Congress established the National Marine Sanctuary System to protect our Nation's "special places" in the marine environment. Today, 25 years later, there are 12 sanctuaries in the system, with a 13th, Thunder Bay in Lake Huron, Michigan undergoing designation. They range from the historic shipwreck of the Civil War vessel the USS Monitor, to the 5,300 square miles encompassing the submerged Monterey Canyon in California. In all, over 18,000 square miles of important marine habitats, including coral reefs, kelp forests, rocky shores, sandy beach and open ocean, are managed and protected by NOAA.

I would like to begin first by talking about the important needs and strong support for the National Marine Sanctuary Program as identified in the President's Lands Legacy Initiative. Second, I will highlight some of the recent accomplishments of the National Marine Sanctuary System. Finally, I would like to present some ideas for the 1999 reauthorization of the NMSA, as presented in the Administration's proposal transmitted to Congress on June 9, 1999.

THE PRESIDENT'S LANDS LEGACY INITIATIVE

The President's FY 2000 budget includes a $1 billion Lands Legacy Initiative to expand federal efforts to save America's natural treasures. This initiative would provide $105 million to NOAA to protect America's valuable ocean and coastal resources and to strengthen state and local efforts to address the problems caused by urban growth and sprawl.

America's ocean and coastal areas are under siege by a whole suite of activities, including coastal population growth, development, maritime commerce, commercial and recreational fishing, and tourism. The economic and environmental well-being we derive from ocean and coastal resources and the beauty they provide is being seriously undermined by the use of these resources in unsustainable ways. Escalating losses and degradation of wetlands, beaches, fisheries, and essential habitats, and marine ecosystems must be reversed.

The Lands Legacy Initiative will help ensure that our Nation's most treasured marine areas are conserved and protected for the benefit of present and future generations. The proposed $15 million increase for the Sanctuary program would, for the first time, allow all existing marine sanctuaries to approach core operating and staffing levels. At core operating level, each sanctuary would have enough staff, equipment, boats, facilities, and resources to carry out its basic mandate to protect sanctuary resources, conduct research, monitoring, education and interpretive programs, and involve local communities in nearly every aspect of sanctuary management. The core operating level varies from site to site and is a function of the Sanctuary's size, location, complexity of resource issues, and management objectives and priorities.

The increased funding would also provide resources to:

(1) Enhance Conservation of Existing Sanctuaries

- Design permanent system-wide monitoring programs to track the status and trends of sanctuary resources and the overall health of the sanctuary ecosystem;
- Expand the coral reef monitoring program;
- Initiate submerged cultural resource survey inventories where appropriate;
- Develop system-wide Geographic Information System (GIS) capability;
- Continue the five-year review and revision of Sanctuary management plans at selected sites; and
- Conduct habitat characterization and mapping at each Sanctuary.

(2) Plan for the Future of the Sanctuary System
The Lands Legacy funding will position the Sanctuary system to consider the protection and conservation of additional significant and threatened areas by:

- First allowing the designation and full implementation of NOAA's thirteenth sanctuary and only site currently in the designation process, Thunder Bay, Michigan in Lake Huron;
- And, once the existing programs are up to par, work with states and communities to identify potential sites for the future.

(3) Expand Environmental Education and Outreach Efforts
Of the $15 million increase, $3 million will begin the process of establishing a network of interpretive facilities, where the public and environmental decision-makers can learn about sanctuary resources and marine conservation issues. Currently, none of our sanctuaries have basic facilities for public education about these special areas. Adequate facilities, especially interpretive centers, are critical for the Sanctuary System as they provide the gateway to visiting a sanctuary. At these interpretive centers, many people will be able to experience and learn about the diverse wonders teeming beneath the waves.

NOAA plans to work, whenever possible, through partnerships with existing aquaria, museums, and other facilities. For example, we are working in partnership with the National Park Service in the Florida Keys to develop a visitors' center with excess Navy property. In Boston, we are partnering with the New England Aquarium to take advantage of the more than one million visitors there. In Hawaii, we plan to complete an interpretive center in Kihei, Maui. These are just a few examples of goals we hope to accomplish in 2000.

YEAR OF OPPORTUNITY

The Year of the Ocean in 1998 provided a tremendous opportunity for NOAA to develop several successful high-profile partnerships which are essential to the sanctuary program. These partnerships increased public awareness of the important work NOAA is doing in our sanctuaries. In March 1998, Dr. Bob Ballard brought the Jason Project to the Monterey Bay Sanctuary in California. Using student argonauts and teachers from around the country, the Jason Project broadcast live educational programs from the Monterey Bay Aquarium, the Sanctuary, and NOAA ships to over two million school children across the U.S. and throughout the world.

One year ago, with a $5 million grant from the Richard and Rhoda Goldman Fund, NOAA and the National Geographic Society launched the Sustainable Seas Expeditions, a five-year project of deep-water exploration and public education in NOAA's National Marine Sanctuaries. Dr. Sylvia Earle, National Geographic Society Explorer-in-Residence, is leading the expeditions to the 12 marine sanctuaries, using the newly designed DeepWorker, a one-person submersible capable of exploring to depths of 2000 feet. New underwater technologies will allow us to bring the ocean treasures of our sanctuaries to classrooms, the public, and scientists and managers in ways never before possible.

The Sustainable Seas Expeditions began on April 15, 1999 at the Gulf of the Farallones NMS off San Francisco. In total, more than 29 research projects and dozens of education projects, including teacher training and student summits, will be conducted throughout the sanctuaries in this first year alone. Through live internet broadcasts and news coverage, millions of Americans will be able to experience these scientific discoveries and extraordinary educational experiences first-hand.

In June 1998, Monterey Bay hosted another important Year of the Ocean activity—the National Ocean Conference. NOAA and the Navy co-hosted an ocean policy conference that brought President Clinton, the First Lady, Vice President Gore, Cabinet Secretaries, Members of Congress, agency heads, conservation groups and industry, scientists and teachers to discuss the role oceans play in our lives and our environment. The Sanctuary organized a highly successful community Oceans Fair

to celebrate our ties to the community and our commitment to conserving the oceans.

Finally, the Audubon Society took the opportunity in its December 1998 issue of Audubon to reflect back on the greatest conservation accomplishments of the past 100 years. In the article, entitled "The Century of Conservation," the society lists "10 of the top gems" in the Nation's "crown jewels of its natural heritage." Within this distinguished list is NOAA's Monterey Bay National Marine Sanctuary.

SANCTUARY MANAGEMENT PLAN IMPLEMENTATION

Management Plan Implementation

I would now like to turn to some recent initiatives and accomplishments of the Sanctuary Program. All 12 designated national marine sanctuaries have management plans that contain site-specific long-range research and education priorities, regulations, and other resource management measures to conserve and protect sanctuary resources. The plans vary in age and complexity as well as the resources they protect. Each year, the sanctuary managers develop annual operating plans to prioritize and detail action items that implement components of their management plans. The number and types of elements included in an annual operating plan are ultimately determined by annual program funding.

The Sanctuary Program has made substantial progress over the last few years, with small appropriation increases and through partnerships, to find additional resources to help implement components of individual sanctuary management plans. However, funding has not been sufficient to allow the program to fully implement every plan.

Sanctuary Management Plan Review

Some of the sanctuary management plans are nearly twenty years old. The site priorities and specific education, research, and resource protection goals may be outdated. Last December, NOAA initiated a process to involve the public in a systematic review of sanctuary management plans. Stellwagen Bank NMS in Massachusetts became the first site in the national system to begin a management plan review process by holding public scoping meetings that will help evaluate the success in meeting sanctuary goals and objectives and by making revisions, if necessary, to its management plan and regulations. Channel Islands (California) has also initiated its five-year review process by holding scoping meetings earlier this month, and Gray's Reef (Georgia) NMS will begin its review process later this year.

Expeditions to U.S.S. Monitor Continue to Meet the Goals of the Monitor Comprehensive Plan Last April, pursuant to Section 4 of Public Law 104-283 (The National Marine Sanctuaries Preservation Act), NOAA submitted to Congress a new plan entitled "Charting a New Course for the *Monitor:* A Comprehensive, Long Range Preservation Plan with Options for Management, Stabilization, Preservation, Recovery, Conservation, and Exhibition of Materials and Artifacts from the *Monitor* National Marine Sanctuary."

The first phase of the plan was initiated last summer during the successful 1998 expedition to the USS Monitor off Cape Hatteras, North Carolina. The primary purpose of this expedition was to complete all tasks that must precede the stabilization of the hull and recovery of major hull components, as called for in the Monitor NMS Long Range Comprehensive Preservation Plan. Major 1998 accomplishments include: thoroughly mapping and documenting key areas of the Monitor's hull, mapping and recovering exposed and threatened artifacts, and recovering of the Monitor's unique iron propeller and an 11-foot section of shaft. The expedition was the combined effort of the U.S. Navy, NOAA's National Marine Sanctuaries, the NOAA Diving Center, the National Undersea Research Center (NURC) / University of North Carolina at Wilmington, the Cambrian Foundation, and The Mariners' Museum.

We are currently undertaking a Navy expedition to test the feasibility of stabilizing the Monitor's hull and removing significant hull components. In August a second expedition involving NOAA, NURC and Cambrian Foundation divers will document and assess the Navy's mission results and continue mapping and recovery of artifacts that might be damaged during the upcoming stabilization and recovery operations. If adequate funding is obtained, the goals for the next two years include the stabilization of the Monitor's hull and the recovery of the steam machinery, guns and turret.

MONITORING OF NATIONAL MARINE SANCTUARY RESOURCES

One of the most critical needs within the Sanctuary Program is monitoring. NOAA is currently developing a system-wide plan to monitor its natural resources.

This effort will begin in our coral reef sites, including the Florida Keys, Flower Gardens, Gray's Reef, Hawaiian Islands, and Fagatele Bay. This initiative is an effort to ensure that all sites containing coral reefs and coral communities have, at a minimum, comparable and effective monitoring. The goals are to obtain information that will provide managers with accurate characterizations of their sites and to describe current conditions in a manner that allows detection of changes over time. The full-funding of our Lands Legacy Initiative is critical to implementing this system-wide monitoring program.

As one component of the coral monitoring program, the Florida Keys National Marine Sanctuary initiated a five-year zone monitoring program in 1997 to look at changes in ecosystem function and populations of key species to gauge the relative effectiveness of the sanctuary's zoning program. Sanctuary and Florida Department of Environmental Protection staff recently brought together various scientists involved in monitoring the zones and determined that, after the first full year of protection, the Sanctuary's 23 no-take zones are showing signs of restoring spiny lobster and fish populations.

The breadth of system-wide, regional, and local monitoring programs will increase with time as specific needs are identified, as management issues emerge, and as partnership opportunities arise. Initial plans are to work with other relevant parts of NOAA to design a focused monitoring program in the sanctuaries. Specifically, a plan is being developed with NOS' National Centers for Coastal Ocean Science that will incorporate many NOAA experts in the design and implementation of the coral reef and system-wide monitoring efforts. In addition, discussions with mapping experts in NOAA and USGS are likely to lead to cooperation on habitat mapping, which will provide site characterizations at larger scales than is possible using ground surveys.

These efforts are but a few examples of the initiatives being undertaken by the National Marine Sanctuary Program to protect and manage our Nation's "special places." With an eye toward the future, I would like to discuss the 1999 reauthorization of the NMSA.

THE NATIONAL MARINE SANCTUARIES PRESERVATION ACT OF 1999

With the help of interested constituents and stakeholders, NOAA has identified areas where the NMSA may be improved. I would like to highlight some of those areas for you today.

Primary Mandate—Resource Protection

The primary mandate of the NMSA is stated as "resource protection". The Administration's proposal clarifies and improves the mandate for ecosystem management by including such language as "maintain natural biodiversity and biological communities, and to protect, and where appropriate, restore and enhance natural habitats, populations, and ecological processes". The Administration's proposal also stresses the importance of "precautionary and preventive management actions".

Effective System Management

Management of the System would not be fully effective without the partnerships of others. The Administration's bill adds language to increase NOAA's ability to use additional resources to manage National Marine Sanctuaries and to expand the role of non-profit organizations and the use of the Sanctuary logo by collaborating organizations.

Decreasing Burdens and Clarifying Procedures

The Administration's proposal simplifies the procedures necessary to change a term of designation for an existing sanctuary. In addition, it increases flexibility and predictability for issuance of special use permits and revises natural resource damage assessment provisions to better reflect current practices.

Strengthening Research and Education Missions

Effective scientific research and education and public outreach are fundamental to good resource protection. To strengthen NOAA's ability to understand and manage sanctuary resources, our proposal emphasizes research and education activities that are appropriate to further our resource protection mission. To better bring our sanctuaries to the public, the Administration's bill also provides for the development of interpretive facilities.

Adequate Funding

Finally, our legislation authorizes $29 million for the Sanctuary Program, as outlined in the President's FY2000 budget request. This increase in funding is imperative to fully and effectively manage the National Marine Sanctuary System. Reau-

thorization of the NMSA provides us with a unique opportunity to strengthen the Nation's only comprehensive system of marine protected areas. We look forward to working with the Committee on these important issues.

CORAL REEF PROTECTION

I would like to turn my attention now to S. 725, the Coral Reef Conservation Act of 1999 and S. 1253, the Coral Reef Protection Act of 1999. I would like to take this opportunity to thank Senators Snowe and Inouye for their leadership in introducing bills to address the serious problems surrounding our coral reefs.

Coral reefs are extremely valuable for a variety of reasons, including the thousands of jobs and billions of dollars they generate every year from tourism, recreation and fishing. Coral reefs are probably the most valuable and the most threatened marine ecosystems on the planet.

Right now the future of these incredible "rainforests of the sea" is very much at risk. Coral reefs in the U.S. and around the world are quickly being destroyed by a powerful combination of stresses such as polluted runoff, fishing impacts, ship groundings, marine debris trade and coral reef species, and new diseases. Most of our fragile coral reefs are being hit by these impacts simultaneously. In addition, we are still discovering the impacts of global climate change on coral reefs. During the past two years we have seen unprecedented levels of coral bleaching and mortality associated with abnormally high sea temperatures. Evidence now shows that increasing carbon dioxide levels could significantly impact reefs worldwide by slowing their growth. Together, these impacts overwhelm the corals and other reef species. Our reefs are dying deaths of a thousand cuts.

The Nation's reefs cannot withstand this onslaught of insults. If we don't act now, we will lose our most precious, valuable and irreplaceable reefs. The social and economic costs to current and future generations will be severe. Many of our coral reefs are in crisis. This is a battle we cannot afford to lose. The Administration strongly supports comprehensive legislation that increases conservation and restoration of coral reefs and coral reef ecosystems. Senate bills 725 and 1253 are powerful steps forward in addressing the coral reef crisis. I applaud the Committee's leadership and commitment to protecting these incredible reef resources and the communities and economies that depend on them.

I would like to briefly present some specific information on the threats to our coral reefs and what can be done to address the coral crisis. I also have specific comments on the two coral bills.

World wide coral reefs cover less than one percent of the ocean floor. They are some of the largest and oldest living structures on earth. Like tropical rainforests they contain some of the highest biodiversity on the planet. Coral reefs are home to 25% of all marine fish species and thousands of other species.

The U.S. has significant coral reefs in the southern Atlantic, Caribbean, Gulf of Mexico, and the western Pacific. Coral reefs in U.S. waters cover approximately 17,000 square kilometers and include:

- The Florida Keys Coral Reef System, the third largest barrier reef in the world reaching over 360 kilometers in length. The Keys coral reefs are home to over 5,500 species and the world's largest sea grass bed (Florida Bay);
- Diverse Caribbean coral reefs in Puerto Rico and the U.S. Virgin Islands;
- Approximately 90% of all U.S. reefs are in the western Pacific islands of Hawaii, Guam, American Samoa, and the Commonwealth of the Northern Marianas.

In the U.S., coral reefs have significant economic and social value. For example, reefs are the foundation of billions of dollars in economic activity through fishing and tourism:

- Over 50% of all federally managed fisheries species depend on coral reefs for some part of their life;
- The annual dockside value of commercial U.S. fisheries from coral reef ecosystems is over $100 million.
- The annual value of reef-dependent recreational fisheries probably exceeds $100 million per year.
- U.S. coral reef ecosystems support billions of dollars in tourism every year. For example, tourism related to coral reef ecosystems produces over $2.0 billion per year in the Florida Keys and Hawaii.

Coral reefs are also valuable sources of new medicines and biochemicals. It is estimated that marine ecosystems, and coral reefs in particular, will be the primary source of new biomedical compounds in the 21st century. Thousands of unique chemicals have already been described and the exploration has just begun. Powerful

new anti-cancer, anti-coagulant, and anti-inflammation compounds have recently been developed from coral reef species.

Coral reefs also help prevent shoreline erosion and provide life saving protection from waves and storms for millions of people in coastal communities.

All of this is currently at risk.

Recent studies suggest that over 60% of the world's coral reefs are being degraded or destroyed by human activities. Ten percent of the reefs may already be degraded beyond recovery.

Many of our Nation's reefs have been destroyed or seriously degraded, especially shallow reefs near coastal areas with large populations. Under natural conditions coral reefs are quite resilient and can recover from natural disturbances such as storms and changes in sea level. The current coral reef crisis is driven by a variety of human activities that together overwhelm the reef and destroy coral reef communities. Signs that our reefs are in trouble are numerous. For example,

- Increased pollution and sedimentation in many coastal areas have damaged reef resources;
- The number of coral diseases and the number of infections has increased dramatically in Florida and Caribbean reefs in the last five years;
- In Florida and Caribbean reefs, two of the most common shallow water coral species have severely declined throughout their range with losses of over 95% in some areas.
- In the Caribbean, over 20% of the reef-dependent fisheries are considered over-fished; the status of most others is unknown;
- In some Hawaiian reefs, the most abundant reef fish species have declined by 40% to 60%.
- Every year hundreds of vessels strike U.S. coral reefs causing significant damage that goes largely unrepaired. In the Florida Keys alone, approximately 500 small vessel groundings occur each year.
- The number of reef-dependent species considered at risk, threatened or endangered is increasing.
- Last year we observed unprecedented levels of coral bleaching associated with abnormally high sea surface temperatures;
- And we have no comprehensive program to monitor, protect or restore the nation's coral reefs.

I wish I could give you a more comprehensive assessment of the condition of U.S. coral reef resources. Unfortunately the data are not available. We estimate that less than 10 % of the Nation's coral reefs have been adequately mapped and characterized to determine their current condition. Even fewer are adequately monitored to track their health.

Our state and territorial partners are in desperate need of maps and other tools, information and resources to implement coral reef monitoring programs, track the health of their reefs, and take action to protect them. Providing this kind of assistance is critical to the future of the Nation's coral reefs because over 35% of all U.S. coral reefs are within state or territorial waters.

On land, we often take maps for granted. Imagine trying to manage our National Forests or make land-use decisions as a state resource manager without adequate maps of where the resources are, what condition they are in, and what they are being used for. This is our current situation for coral reefs. Local, state and federal managers are having to make very difficult decisions without some of the most basic information.

We can dramatically change this situation. By helping states and territories implement effective mapping, assessment, monitoring, research and restoration, we can build a comprehensive effort to regularly track and improve the health of U.S. coral reefs. This is one of two critical steps towards winning the battle for our coral reefs.

The other critical step is action. Many of our corals are being destroyed faster than they can recover. We must reduce the threats to our reefs or face the very real possibility that coral reefs as we know them will disappear within our lifetime.

In many cases we know what the problems are and what we need to do to solve them. The best possible way to protect and restore coral reefs is to stop the things that are destroying them. We must act now at local, state or territory and national levels to reduce the impacts of coastal water pollution, fishing impacts, marine debris, ship strikes and other key threats to our reefs.

At the National Ocean Conference, President Clinton signed Executive Order 13089 on coral reef protection which established the U.S. Coral Reef Task Force, which is co-chaired by the Department of Commerce and the Department of Interior, and tasked federal agencies with developing new comprehensive measures to map,

monitor, protect and restore our precious coral reefs. As part of the U.S. Coral Reef Task Force, federal agencies, states and territories are developing a national action plan to prioritize and address threats to our Nation's reefs.

While the Task Force Action Plan is still in draft form, the Task Force has already identified many of the key threats and possible solutions as called for in the Executive Order. Key actions proposed for FY 2000 include:

1. Launching a comprehensive effort to map and assess U.S. coral reefs in the Pacific;
2. Establish a coordinated network of coral reef protected areas, building on existing sites and activities;
3. Implement a coordinated reef monitoring program;
4. Build emergency response capabilities and restoration efforts;
5. Strengthen local and regional efforts to protect and manage reefs by supporting the U.S. Islands Coral Reef Initiative.
6. Work on the international front to address global and regional threats to coral reefs.

NOAA's FY 2000 budget includes $12 million to directly support these actions and begin fulfilling the Executive Order for conservation and restoration of coral reefs. It is NOAA's first request specifically targeting coral reefs. NOAA has no funding to specifically address the coral crisis at this time. S. 725 and S. 1253 both propose authorization for important new resources to begin addressing the coral crisis. Both bills would establish a competitive grant program to make these resources available to government and non-government entities at local, state and territory levels where direct actions can be taken to protect individual reefs. We strongly support these programs and their focus on, on-the-ground efforts such as monitoring, management, education and restoration. We would consult with our partners on the Coral Reef Task Force to effectively direct such resources.

Both bills also include an important tool to leverage federal dollars by establishing a formal mechanism for working with a qualified non-profit organization to collect and allocate matching monetary donations from the private sector. We believe local-level actions and public-private partnerships are powerful tools for coral reef conservation and restoration. However, the Administration recommends that section 5 of S. 725 and section 10 of S. 1253 be amended to conform to the following principles. Federal funds should not earn interest, should not be under the control of non-Federal personnel and should not be held outside of the Treasury.

S. 1253 includes several additional elements to comprehensively address aspect of the coral crisis. For example, it includes authorizations to directly support federal efforts to conserve and restore coral reefs. NOAA has a wide range of responsibilities for coral reefs and reef resources including management of federal fisheries and National Marine Sanctuaries with coral resources. NOAA currently has tools and capabilities that, with these additional resources, could provide key tools, information and resources to help government and non-governmental partners protect, restore and sustainably use coral reefs.

S. 1253 also includes a provision to help prevent the destructive and dangerous practice of abandoning vessels on U.S. reefs. We are very concerned about the risks these vessels create to the reefs and the coastal communities that depend on them. We are also concerned about the lack of effective mechanisms to prevent and remove such vessels. We believe this provision in S. 1253 could help prevent vessel abandonment on coral reefs but want to work with the Committee to review additional measures which may also be necessary. We look forward to working with you, our federal and state partners, and the private sector to develop a broader approach to addressing this problem.

The Administration's FY 2000 budget includes a total of $21 million in new funding to support the coral reef conservation and restoration efforts I've discussed here today. This includes $12 million for the Department of Commerce and $9 million for the Department of the Interior. Coordinated action by both NOAA and the Department of the Interior are essential to meet the Nation's coral reef conservation needs. S. 1253 provides the necessary authorization to carry out these actions for our coral reefs.

I would like to reiterate the Administration's strong support for comprehensive legislation that increases conservation and protection of coral reefs and coral reef ecosystems. I thank Senators Snowe and Inouye for focusing on this important issue.

CONCLUSION

In conclusion, I applaud the Committee's leadership and commitment to protecting our incredible ocean resources, and the communities and economies that depend on them. We look forward to working with you to win the battle for the Nation's precious coral reefs and our valuable National Marine Sanctuaries.

Ms. YOZELL. First and foremost, I want to commend the Committee for its leadership on these issues. Let me turn, however, to the Sanctuaries Act reauthorization. The Sanctuaries Act is responsible for a unique network of marine protected areas dedicated to the conservation of nationally significant habitats for the enjoyment and use by present and future generations.

Marine protected areas play a critical role in ensuring a healthy environment and a healthy economy. For purposes of today's hearing I would like to focus my remarks on the Administration's proposal and give some examples of our accomplishments and successful partnerships.

The Administration's support for the act was reinforced recently when the President announced his Lands Legacy Initiative in his fiscal year 2000 budget request. This includes an increase of $15 million to strengthen the sanctuary program in the following three areas:

First, if Congress provides the increase, funds will be used to enhance the conservation and management of existing sanctuaries. So what that means is for the first time sufficient funds would be available for all of the existing sanctuaries to approach just a core operating and staffing level.

Second, the increase will be used to support critical sanctuary education and outreach efforts. Sanctuaries, because they are located mostly offshore and underwater, are difficult places for Americans to visit and learn about. None of the sanctuaries currently have interpretive facilities, so trying to understand these places is very difficult, and understanding them is key to their protection.

Third, the Lands Legacy funding will enable NOAA to work with coastal communities and States and others to identify and evaluate potential new areas for growth. Presently Thunder Bay, located in Lake Huron, Michigan, is the only site undergoing active designation.

NOAA has been working with our stakeholders to identify changes we need to make to the program to make it more effective. Earlier this month we transmitted to Congress the National Marine Sanctuaries Preservation Act of 1999, and I will submit that for the record as well.

Senator Snowe: Without objection.

[The information referred to follows:]

National Marine Sanctuaries Preservation Act of 1999

106th CONGRESS
2d Session

A BILL

To reauthorize and amend the National Marine Sanctuaries Act and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1.

This Act may be cited as the "National Marine Sanctuaries Preservation Act of 1999."

SECTION 2.

The National Marine Sanctuaries Act (16 U.S.C. 1431 et seq.) is amended to read as follows:

"THE NATIONAL MARINE SANCTUARIES ACT"

16 U.S.C. 1431 *et seq.*

[NOTE: The Oceans Act of 1992, Pub. L. 102–587, and the National Marine Sanctuaries Preservation Act of 1996, Pub. L. 104–283, contain provisions pertaining to national marine sanctuaries.]

Sec. 301. FINDINGS, PURPOSES, AND POLICIES

(a) FINDINGS.—The Congress finds that—

(1) this Nation historically has recognized the importance of protecting special areas of its public domain, but these efforts have been directed almost exclusively to land areas above the high-water mark;

(2) certain areas of the marine environment possess conservation, recreational, ecological, historical, research, monitoring, educational, cultural, archaeological or aesthetic qualities, which give them special national, and in some instances, international, significance;

(3) while the need to control the effects of particular activities has led to enactment of resource-specific legislation, these laws cannot in all cases provide coordinated and comprehensive ecosystem conservation and management to special areas of the marine environment;

(4) a Federal program which identifies special areas of the marine environment will contribute positively to marine resources conservation, research, and management;

(5) such a Federal program of marine protected areas will also serve to enhance public awareness, understanding, appreciation, and sustainable use of the marine environment;

(6) this integrated network of marine protected areas, the National Marine Sanctuary System, provides added value to the nation beyond their individual boundaries by applying innovative management techniques across the entire national system; and

(7) protecting the biodiversity, habitats, and qualities of such special areas through precautionary and preventive management actions can contribute to maintaining a natural assemblage of living resources and the values and ecological services they provide for future generations.

(b) PURPOSES AND POLICIES.—The purposes and policies of this title are—

(1) to identify and designate as national marine sanctuaries areas of the marine environment which are of special national significance;

(2) to provide authority for comprehensive and coordinated conservation and management of these marine areas, and activities affecting them, in a manner which complements existing regulatory authorities;

(3) to maintain natural biodiversity and species assemblages, and to protect, and where appropriate, restore and enhance, natural habitats, populations, and ecological processes

(4) to enhance public awareness, understanding and appreciation of the marine environment and the natural, historical, cultural, and archaeological resources of national marine sanctuaries, in order to ensure their conservation and sustainable use for future generations;

(5) to support, promote, and coordinate appropriate scientific research on, and long-term monitoring of the resources of these marine protected areas;

(6) to allow to the extent compatible with the primary objective of resource protection, all public and private uses of the resources of these marine areas not prohibited pursuant to other authorities;

(7) to develop and implement coordinated plans for the protection and management of these areas with appropriate Federal agencies, State and local governments, Native American tribes and organizations, international organiza-

tions, and other public and private interests concerned with the continuing health and resilience of these marine areas;

(8) to create models of, and incentives for, ways to conserve and manage these areas, including the application of innovative management techniques;

(9) and to cooperate with global programs encouraging conservation of marine resources.

Sec. 302. DEFINITIONS

As used in this title, the term—

(1) "draft management plan" means the plan described in section 304 (a)(2)(A) of this title;

(2) "Magnuson Act" means the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 et seq.);

(3) "marine environment" means those areas of coastal and ocean waters, the Great Lakes and their connecting waters, and submerged lands over which the United States exercises jurisdiction, including the exclusive economic zone, consistent with international law;

(4) "exclusive economic zone" means the exclusive economic zone as defined in the Magnuson-Stevens Fishery Conservation and Management Act;

(5) "Secretary" means the Secretary of Commerce;

(6) "State" means each of the several States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, American Samoa, the Virgin Islands, Guam, and any other commonwealth, territory, or possession of the United States;

(7) "sanctuary resource" means any living or nonliving resource of a national marine sanctuary that contributes to the conservation, recreational, ecological, historical, research, monitoring, educational, cultural, archaeological, or aesthetic value of the sanctuary;

(8) "injure" means to change adversely a sanctuary resource, including, but not limited to, adversely changing a chemical, biological, or physical attribute of a sanctuary resource, or impairing a sanctuary resource service. Injury may occur directly, indirectly or cumulatively, and may be either long or short-term. Injure includes, but is not limited to, to cause the loss of, loss of use, or destroy;

(9) "service" means a function performed by a sanctuary resource for the benefit of another sanctuary resource, other natural resource or the public;

(10) "person" means any individual, corporation, partnership, or other entity, or any officer, employee, agent, department, agency, or instrumentality of the Federal government, of any State or local unit of government, or of any foreign government;

(11) "damages" includes—

(A) compensation for—

(1) the cost of restoring or rehabilitating the injured sanctuary resource and its services to baseline condition *until the sanctuary* resource has recovered to its baseline condition; and

(2) (i) the cost of replacing or acquiring resources and services of equivalent value to the sanctuary resources and services lost; or

(ii) the value of the sanctuary resources and services from the date the injury occurred until the sanctuary resource has recovered to its baseline condition;

(B) the cost of damage assessments under section 312(b)(2);

(C) the reasonable cost of monitoring appropriate to the injured, restored, or replaced resources;

(D) the cost of curation and conservation of archaeological, historical and cultural sanctuary resources; and

(E) the cost of enforcement actions undertaken by the Secretary for losses to sanctuary resources;

(12) "baseline" means the condition of sanctuary resources and services that would have existed had the incident not occurred;

(13) "response costs" means the costs of actions taken or authorized by the Secretary to minimize destruction or loss of, or injury to, sanctuary resources, or to minimize the imminent risks of such destruction, loss, or injury, including enforcement activities related to any incident; and

(14) "cause" means a reasonably close causal connection between the conduct and the resulting injury.

Sec. 303. SANCTUARY DESIGNATION STANDARDS

(a) STANDARDS.—The Secretary may designate any discrete area of the marine environment as a national marine sanctuary and promulgate regulations implementing the designation if the Secretary—

(1) determines that the designation will fulfill the purposes and policies of this title; and

(2) finds that—

(A) the area is of special national significance due to its biodiversity, its ecological importance, its archaeological, cultural or historical importance, or its human use values;

(B) existing State and Federal authorities should be supplemented to ensure coordinated and comprehensive conservation and management of the area, including resource protection, scientific research, and public education;

(C) designation of the area as a national marine sanctuary will facilitate the objectives in subparagraph (B); and

(D) the area is of a size and nature that will permit comprehensive and coordinated conservation and management,

(b) FACTORS AND CONSULTATIONS REQUIRED IN MAKING DETERMINATIONS AND FINDINGS.—

(1) Factors.—For purposes of determining if an area of the marine environment meets the standards set forth in subsection (a), the Secretary shall consider—

(A) the area's natural resource and ecological qualities, including its biodiversity, species assemblages, ecological significance, biogeographic representation, contribution to local and regional biological productivity, ecosystem structure and function, and the maintenance of ecologically or economically important habitats and species, including threatened and endangered species;

(B) the area's historical, cultural, archaeological, or paleontological significance;

(C) the present and potential human uses of the area that depend on maintenance of a healthy and functional natural ecosystem;

(D) the present, and potential activities that may threaten or otherwise adversely affect the factors identified in subparagraphs (A), (B), (C);

(E) the area's scientific value as a protected area;

(F) the existing State and Federal regulatory and management authorities applicable to the area and the adequacy of those authorities, to fulfill the purposes and policies of this title;

(G) the manageability of the area, including such factors as its size, its location, its vulnerability to significant ecological disturbance, its ability to be identified as a discrete ecological unit with definable boundaries, its accessibility, and its suitability for monitoring and enforcement activities;

(H) the feasibility, where appropriate, of employing innovative management approaches to protect sanctuary resources or manage compatible uses.

(I) the value of the site as part of an integrated network of marine protected areas, both within the National Marine Sanctuary System, and in the broader context of marine protected areas throughout the United States and internationally.

(J) the public benefits to be derived from sanctuary status, with emphasis on the benefits of long-term protection of nationally significant resources, qualities and vital habitats;

(K) the negative impacts produced by management restrictions on income-generating activities such as living and nonliving resources development; and

(L) the socioeconomic effects of sanctuary designation.

(2) Consultation.—In making determinations and findings, the Secretary shall consult with—

(A) the Committee on Resources of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate;

(B) the Secretaries of State, Defense, Transportation, and the Interior, the Administrator of the Environmental Protection Agency, and the heads of other interested Federal agencies;

(C) the responsible officials or relevant agency heads of the appropriate State and local government entities, including coastal zone management agencies, that will or are likely to be affected by the establishment of the area as a national marine sanctuary;
(D) the appropriate officials of any Regional Fishery Management Council established by section 302 of the Magnuson Act (16 U.S.C. 1852) that may be affected by the proposed designation; and
(E) other interested persons.

(3) Resource Assessment Report.—In making determinations and findings, the Secretary shall draft, as part of the environmental impact statement referred to in section 304(a)(3), a resource assessment report documenting present and potential uses of the area, including commercial and recreational fishing, research and education, minerals and energy development, subsistence uses, and other commercial, governmental, or recreational uses. The Secretary, in consultation with the Secretary of the Interior, shall draft a resource assessment section for the report regarding any commercial, governmental, or recreational resource uses in the area under consideration that are subject to the primary jurisdiction of the Department of the Interior. The Secretary, in consultation with the Secretary of Defense, the Secretary of Energy, and the Administrator of the Environmental Protection Agency, shall draft a resource assessment section for the report including information on any past, present or proposed future disposal or discharge of materials in the vicinity of the proposed sanctuary. Public disclosure by the Secretary of such information shall be consistent with national security regulations.

Sec. 304. PROCEDURES FOR DESIGNATION AND IMPLEMENTATION

(a) SANCTUARY PROPOSAL.—

(1) Notice.—In proposing to designate a national marine sanctuary, the Secretary shall—

(A) issue, in the Federal Register, a notice of the proposal, proposed regulations that may be necessary and reasonable to implement the proposal, and a summary of the draft management plan;
(B) provide notice of the proposal in newspapers of general circulation or electronic media in the communities that may be affected by the proposal; and
(C) on the same day the notice required by subparagraph (A) is issued, the Secretary shall submit to the Committee on Resources of the House of Representatives and the Committee on Commerce, Science and Transportation of the Senate Science and Transportation of the Senate the following:

(i) the draft environmental impact statement prepared pursuant to 304(a)(3);
(ii) the draft Management Plan prepared pursuant to 304(a)(2);
(iii) the basis of the findings made under section 303(a) with respect to the area;
(iv) an assessment of the considerations under section 303(b)(1);
(v) an estimate of the annual cost of the proposed designation, including costs of personnel, equipment and facilities, enforcement, research, and public education;

(2) Management Plan.—The Secretary shall—

(A) prepare a Management Plan document for the proposed sanctuary that includes:

(i) the terms of the proposed designation;
(ii) proposed mechanisms to coordinate existing regulatory and management authorities within the area;
(iii) the proposed goals and objectives; management responsibilities; resource studies; and appropriate strategies for managing sanctuary resources, interpretation and education, research, monitoring and assessment, resource protection, restoration, and enforcement, including surveillance activities for the area;
(iv) an evaluation of the advantages of cooperative State and Federal management if all or part of a proposed marine sanctuary is within the territorial limits of any State or is superjacent to the subsoil and seabed within the seaward boundary of a State, as that boundary is established under the Submerged Lands Act (43 U.S.C. 1301 et seq.); and

(v) the proposed regulations referred to in subparagraph (A).

(B) make copies of the draft Management Plan available to the public.

(3) Environmental Impact Statement.—The Secretary shall—

(A) prepare a draft environmental impact statement, pursuant to the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.), on the proposal that includes the resource assessment report required under section 303(b)(3), maps depicting the boundaries of the proposed designated area, and the existing and potential uses and resources of the area, and
(B) make copies of the draft environmental impact statement available to the public.

(4) Terms of Designation.—The terms of designation of a sanctuary shall include: the geographic area proposed to be included within the sanctuary; the characteristics of the area that give it conservation, recreational, ecological, historical, research, monitoring, educational, cultural, archaeological or aesthetic value; and a list of the types of activities that may be subject to regulation to protect sanctuary resources. The terms of designation may be modified by following the applicable procedures of the National Environmental Policy Act and the Administrative Procedure Act.

(5) Public Hearing.—No sooner than thirty days after issuing a notice under this subsection, the Secretary shall hold at least one public hearing in the coastal area or areas that will be most affected by the proposed designation of the area as a national marine sanctuary for the purpose of receiving the views of interested parties.

(6) Fishing Regulations.—The Secretary shall provide the appropriate Regional Fishery Management Council with the opportunity to prepare draft regulations for fishing within the Exclusive Economic Zone as the Council may deem necessary to implement the proposed designation. Draft regulations prepared by the Council, or a Council determination that regulations are not necessary pursuant to this paragraph, shall be accepted and issued as proposed regulations by the Secretary unless the Secretary finds that the Council's action fails to fulfill the purposes and policies of this title and the goals and objectives of the proposed designation. In preparing the draft regulations, a Regional Fishery Management Council shall use as guidance the national standards of section 301(a) of the Magnuson Act (16 U.S.C. 1851) to the extent that the standards are consistent and compatible with the goals and objectives of this Act and the proposed designation. The Secretary shall prepare the fishing regulations, if the Council declines to make a determination with respect to the need for regulations, makes a determination which is rejected by the Secretary, or fails to prepare the draft regulations in a timely manner. Any amendments to the fishing regulations shall be drafted, approved, and issued in the same manner as the original regulations. The Secretary shall also cooperate with other appropriate fishery management authorities with rights or responsibilities within a proposed sanctuary at the earliest practicable stage in drafting any sanctuary fishing regulations.

(7) Committee Action.—After receiving the documents under subsection (a)(l)(C), Committee on Resources of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate may each hold hearings on the proposed designation and on the matters set forth in the documents. If within the forty-five day period of continuous session of Congress beginning on the date of submission of the documents, either Committee issues a report concerning matters addressed in the documents, the Secretary shall consider this report before publishing a notice to designate the national marine sanctuary.

(b) SANCTUARY DESIGNATION.—

(1) Notice.—In designating a national marine sanctuary, the Secretary shall publish in the Federal Register notice of the designation together with final regulations to implement the designation and any other matters required by law, and submit such notice to the Congress. The Secretary shall advise the public of the availability of the final management plan and the final environmental impact statement with respect to such sanctuary. The Secretary shall issue a notice of designation with respect to a proposed national marine sanctuary site not later than 30 months after the date a notice declaring the site to be an active candidate for sanctuary designation is published in the Federal Register under regulations issued under this Act, or shall publish not later than such date in the Federal Register findings regarding why such notice has not been

published. No notice of designation may occur until the expiration of the period for Committee action under subsection (a)(6). The designation (and any of its terms not disapproved under this subsection) and regulations shall take effect and become final after the close of a review period of forty-five days of continuous session of Congress beginning on the day on which such notice is published unless in the case of a national marine sanctuary that is located partially or entirely within the seaward boundary of any State, the Governor affected certifies to the Secretary that the designation or any of its terms is unacceptable, in which case the designation or the unacceptable term shall not take effect in the area of the sanctuary lying within the seaward boundary of the State.

(2) Withdrawal of Designation.—If the Secretary considers that actions taken under paragraph (1) will affect the designation of a national marine sanctuary in a manner that the goals and objectives of the sanctuary or the national system cannot be fulfilled, the Secretary may withdraw the entire designation. If the Secretary does not withdraw the designation, only those terms of the designation not certified under paragraph (1) shall take effect.

(3) Procedures.—In computing the forty-five-day periods of continuous session of Congress pursuant to subsection (a)(6) of this section and paragraph (1) of this subsection—

(A) continuity of session is broken only by an adjournment of Congress sine die; and

(B) the days on which either House of Congress is not in session because of an adjournment of more than three days to a day certain are excluded.

(c) ACCESS AND VALID RIGHTS.—

(1) Nothing in this title shall be construed as terminating or granting to the Secretary the right to terminate any valid lease, permit, license, or right of subsistence use or of access that is in existence on the date of designation of any national marine sanctuary.

(2) The exercise of a lease, permit, license, or right is subject to regulation by the Secretary consistent with the purposes for which the sanctuary is designated.

(d) INTERAGENCY COOPERATION.—

(1) Review of Agency Actions.—

(A) In General.—Federal agency actions internal or external to a national marine sanctuary, including private activities authorized by licenses, leases, or permits, that are likely to destroy, cause loss of, or injure any sanctuary resource are subject to consultation with the Secretary.

(B) Agency Statements Required.—Subject to any regulations the Secretary may establish each Federal agency proposing an action described in subparagraph (A) shall provide the Secretary with a written statement describing the action and its potential effects on sanctuary resources at the earliest practicable time, but in no case later than 45 days before the final approval of the action unless such Federal agency and the Secretary agree to a different schedule.

(C) Programmatic Consultation.—The Secretary may conduct programmatic consultations with a Federal Agency, as the Secretary deems appropriate.

(2) Secretary's Recommended Alternatives.—If the Secretary finds that a Federal agency action is likely to destroy, cause the loss of, or injure a sanctuary resource, the Secretary shall (within 45 days of receipt of complete information on the proposed agency action) recommend reasonable and prudent alternatives, which may include conduct of the action elsewhere, which can be taken by the Federal agency in implementing the agency action that will protect sanctuary resources.

(3) Response to Recommendations.—The agency head who receives the Secretary's recommended alternatives under paragraph (2) shall promptly consult with the Secretary on the alternatives.

(4) If the agency head decides not to follow the alternatives, the agency head shall provide the Secretary with a written statement explaining the reasons for that decision, including a description of the actions, if any, the agency head deems reasonable for the agency to take to prevent the destruction, loss, or injury of sanctuary resources. In the event that the federal agency takes action contrary to the Secretary's recommendation and such action results in actual destruction of, loss of, or injury to a sanctuary resource, including but not limited to toxic spills and vessel groundings caused by the federal agency, the

agency head shall promptly coordinate with the Secretary and take appropriate action to respond to and mitigate the resulting destruction, loss or injury and, if possible, restore, replace, or provide the equivalent of the Sanctuary resource.

(e) REVIEW OF MANAGEMENT PLANS.—Not more than 5 years after the date of designation of any national marine sanctuary, and thereafter at intervals not exceeding 5 years, the Secretary shall evaluate the substantive progress toward implementing the management plan and goals for the sanctuary, especially the effectiveness of site-specific management techniques and strategies, and shall revise the management plan and regulations as necessary to fulfill the purposes and policies of this title.

Sec. 305. APPLICATION OF REGULATIONS; INTERNATIONAL NEGOTIATIONS AND COOPERATION

(a) REGULATIONS.—This title and the regulations issued under section 304 shall be applied in accordance with generally recognized principles of international law, and in accordance with treaties, conventions, and other agreements to which the United States is a party. No regulation shall apply to or be enforced against a person who is not a citizen, national, or resident alien of the United States, unless in accordance with—

(1) generally recognized principles of international law;
(2) an agreement between the United States and the foreign state of which the person is a citizen; or
(3) an agreement between the United States and the flag state of a foreign vessel, if the person is a crewmember of the vessel.

(b) NEGOTIATIONS.—The Secretary of State, in consultation with the Secretary, should take appropriate action to enter into negotiations with other governments to make necessary arrangements for the protection of any national marine sanctuary and to promote the purposes for which the sanctuary is established.

(c) INTERNATIONAL COOPERATION.—The Secretary, in consultation with the Secretary of State and other appropriate Federal agencies, shall cooperate with other governments and international organizations in the furtherance of the purposes and policies of this title and consistent with applicable regional and multilateral arrangements for the protection and management of special marine areas.

Sec. 306. PROHIBITED ACTIVITIES

It is unlawful to—

(1) destroy, cause the loss of, or injure any sanctuary resource managed under law or regulations for that sanctuary;
(2) possess, offer for sale, sell, purchase, import, export, deliver, carry, transport, or ship by any means any sanctuary resource taken in violation of this section;
(3) interfere with the enforcement of this title by—

(A) refusing to permit any authorized officer to board a vessel, other than a vessel operated by the Department of Defense or United States Coast Guard, subject to such person's control for purposes of conducting any search or inspection in connection with the enforcement of this title;
(B) assaulting, resisting, opposing, impeding, intimidating, or interfering with any authorized officer in the conduct of any search or inspection performed under this title;
(C) submitting false information to the Secretary or any officer authorized by the Secretary in connection with any search or inspection conducted under this title; or
(D) assaulting, resisting, opposing, impeding, intimidating, harassing, bribing, or interfering with any person authorized by the Secretary to implement the provisions of this title; or

(4) violate any provision of this title or any regulation, or permit issued pursuant to this title.

Sec. 307. ENFORCEMENT

(a) IN GENERAL.—The Secretary shall conduct such enforcement activities as are necessary to carry out this title.

(b) POWERS OF AUTHORIZED OFFICERS.—Any person who is authorized to enforce this title may—

(1) arrest any person, if he has reasonable cause to believe that such person has committed an act prohibited by section 306(3);

(2) board, search, inspect, and seize any vessel suspected of being used to violate this title or any regulation or permit issued under this title and any equipment, stores, and cargo of such vessel;

(3) seize wherever found any sanctuary resource taken or retained in violation of this title or any regulation or permit issued under this title;

(4) seize any evidence of a violation of this title or of any regulation or permit issued under this title;

(5) execute any warrant or other process issued by any court of competent jurisdiction; and

(6) exercise any other lawful authority.

(c) CRIMINAL OFFENSES.—

(1) Offenses.—A person is guilty of an offense if he commits any act prohibited by section 306(3).

(2) Punishment.—Any offense described in subsection (1) is punishable by a fine of not more than $100,000, or imprisonment for not more than 6 months, or both; except that if in the commission of any such offense the person uses a dangerous weapon, engages in conduct that causes bodily injury to any officer authorized to enforce this title or any person authorized to implement the provisions of this title, or places any such officer or person in fear of imminent bodily injury, the offense is punishable by a fine of not more than $200,000, or imprisonment for not more than 10 years, or both.

(3) Jurisdiction.—There is Federal jurisdiction over any offense described in this section.

(d) CIVIL PENALTIES.—

(1) Civil penalty.—Any person subject to the jurisdiction of the United States who violates this title or any regulation or permit issued under this title shall be liable to the United States for a civil penalty of not more than $109,000 for each such violation, to be assessed by the Secretary. Each day of a continuing violation shall constitute a separate violation.

(2) Notice.—No penalty shall be assessed under this subsection until after the person charged has been given notice and an opportunity for a hearing.

(3) In Rem Jurisdiction.—A vessel used in violating this title or any regulation or permit issued under this title shall be liable in rem for any civil penalty assessed for such violation. Such penalty shall constitute a maritime lien on the vessel and may be recovered in an action in rem in the district court of the United States having jurisdiction over the vessel.

(4) Review of Civil Penalty.—Any person against whom a civil penalty is assessed under this subsection may obtain review in the United States district court for the appropriate district by filing a complaint in such court not later than 30 days after the date of such order.

(5) Collection of Penalties.—If any person fails to pay an assessment of a civil penalty under this section after it has become a final and unappealable order, or after the appropriate court has entered final judgment in favor of the Secretary, the Secretary shall refer the matter to the Attorney General, who shall recover the amount assessed in any appropriate district court of the United States. In such action, the validity and appropriateness of the final order imposing the civil penalty shall not be subject to review.

(6) Compromise or Other Action by Secretary.—The Secretary may compromise, modify, or remit, with or without conditions, any civil penalty which is or may be imposed under this section.

(e) JUDICIAL CIVIL PENALTIES.—The Secretary may bring an action to access and collect any civil penalty for which a person is liable under paragraph (d)(1) in the United States district court for the district in which the person from whom the penalty is sought resides, in which such person's principal place of business is located, or where the incident giving rise to civil penalties under this section occurred.

(f) FORFEITURE.—

(1) In General.—Any vessel (including the vessel's equipment, stores, and cargo) and other items used, and any sanctuary resource taken or retained, in any manner, in connection with or as a result of any violation of this title or of any regulation or permit issued under this title shall be subject to forfeiture to the United States pursuant to a civil proceeding under this subsection. The proceeds from forfeiture actions under this subsection shall constitute a sepa-

rate recovery in addition to any amounts recovered as civil penalties under this section or as civil damages under section 312. None of those proceeds shall be subject to set-off.

(2) Application of the Customs Laws.—The Secretary may exercise the authority of any United States official granted by any relevant customs law relating to the seizure, forfeiture, condemnation, disposition, remission, and mitigation of property in enforcing this title.

(3) Disposal of Sanctuary Resources.—Any sanctuary resource seized pursuant to this title may be disposed of pursuant to an order of the appropriate court or, if perishable, in a manner prescribed by regulations promulgated by the Secretary. Any proceeds from the sale of such sanctuary resource shall for all purposes represent the sanctuary resource so disposed of in any subsequent legal proceedings.

(4) Presumption.—For the purposes of this section there is a rebuttable presumption that all sanctuary resources found on board a vessel that is used or seized in connection with a violation of this title or of any regulation or permit issued under this title were taken or retained in violation of this title or of a regulation or permit issued under this title.

(g) PAYMENT OF STORAGE, CARE, AND OTHER COSTS.—

(1) Expenditures.—

(A) Notwithstanding any other law, amounts received by the United States as civil penalties, forfeitures of property, and costs imposed under paragraph (2) shall be retained by the Secretary in the manner provided for in section 107(f)(1) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980.

(B) Amounts received under this section for forfeitures and costs imposed under paragraph (2) shall be used to pay the reasonable and necessary costs incurred by the Secretary to provide temporary storage, care, maintenance and disposal of any sanctuary resource or other property seized in connection with a violation of this title or any regulation or permit issued under this title.

(C) Amounts received under this section as civil penalties and any amounts remaining after the operation of subparagraph (B) shall be used, in order of priority, to—

(i) manage and improve the national marine sanctuary with respect to which the violation occurred that resulted in the penalty or forfeiture, with priority given to protecting and enhancing the sanctuary's resource(s);

(ii) pay a reward to any person who furnishes information leading to an assessment of a civil penalty, or to a forfeiture of property, for a violation of this title or any regulation or permit issued under this title; and

(iii) manage and improve any other national marine sanctuary, with priority given to protecting and enhancing the sanctuary's resource(s), particularly degraded resources.

(2) Liability for Costs.—Any person assessed a civil penalty for a violation of this title or of any regulation or permit issued under this title, and any claimant in a forfeiture action brought for such a violation, shall be liable for the reasonable costs incurred by the Secretary in storage, care, and maintenance of any sanctuary resource or other property seized in connection with the violation.

(h) SUBPOENAS.—In the case of any hearing under this section which is determined on the record in accordance with the procedures provided for under section 554 of title 5, United States Code, the Secretary may issue subpoenas for the attendance and testimony of witnesses and the production of relevant papers, books, electronic files and documents, and may administer oaths.

(i) NATIONWIDE SERVICE OF PROCESS.—In any action by the United States under this chapter, process may be served in any district where the defendant is found, resides, transacts business, or has appointed an agent for the service of process.

(j) USE OF RESOURCES OF STATE AND OTHER FEDERAL AGENCIES.—The Secretary shall, whenever appropriate, use by agreement the personnel, services, and facilities of State and other Federal departments, agencies, and instrumental-

ities on a reimbursable or nonreimbursable basis, to carry out the Secretary's responsibilities under this section.

(k) COAST GUARD AUTHORITY NOT LIMITED.—Nothing in this section shall be considered to limit the authority of the Coast Guard to enforce this or any other Federal law under section 89 of title 14, United States Code.

(l) INJUNCTIVE RELIEF.—If the Secretary determines that there is an imminent risk of destruction or loss of or injury to a sanctuary resource, or that there has been actual destruction or loss of, or injury to, a sanctuary resource which may give rise to liability under section 312, the Attorney General, upon request of the Secretary, shall seek to obtain such relief as may be necessary to abate such risk or actual destruction, loss, or injury, or to restore or replace the sanctuary resource, or both. The district courts of the United States shall have jurisdiction in such a case to order such relief as the public interest and the equities of the case may require.

(m) AREA OF APPLICATION AND ENFORCEABILITY.—The area of application and enforceability of this title includes the territorial sea of the United States, as described in Presidential Proclamation 5928 of December 27, 1988, which is subject to the sovereignty of the United States, and the United States exclusive economic zone, consistent with international law.

Sec. 308. REGULATIONS AND SEVERABILITY

(a) The Secretary may issue such regulations, in accordance with 5 U.S.C. 553, as may be necessary to carry out any provision of this Act.

(b) If any provision of this Act or the application thereof to any person or circumstances is held invalid, the validity of the remainder of this Act and of the application of such provision to other persons and circumstances shall not be affected thereby.

Sec. 309. RESEARCH, MONITORING AND EDUCATION PROGRAMS AND INTERPRETIVE FACILITIES

(a) IN GENERAL.—The Secretary shall conduct, support or coordinate research, monitoring and education programs consistent paragraphs (b) and (c) of this section. Such efforts shall be consistent with the purposes and policies of this title and focus primarily on understanding the natural processes necessary to maintain biodiversity and viable ecosystems, and on reducing anthropogenic impacts to their long-term conservation and threats thereof.

(b) RESEARCH AND MONITORING.—The Secretary may support, promote, and coordinate appropriate research on, and long-term monitoring of, the resources and human uses of marine sanctuaries, with particular emphasis on maintaining or restoring diversity of living marine resources, their habitats, ecological processes, and functions fundamental to the viability and conservation of these protected areas. Specific activities may include, but are not limited to: research, monitoring, exploration, mapping, and environmental and socio-economic assessment. In addition, the Secretary may undertake restoration efforts to enhance the rate of recovery of degraded habitats or resources, and may develop and test appropriate restoration methods. The results of such efforts will be made accessible to all interested parties.

(c) EDUCATION AND INTERPRETIVE FACILITIES.—

(1) The Secretary may support, promote, and coordinate efforts to enhance public awareness, understanding and appreciation of the marine environment, in order to ensure better understanding of resources and natural processes and their conservation for future generations. Such efforts will emphasize the conservation goals of national marine sanctuaries, and will, to the extent practicable, address specific threats to sanctuary resources stemming from human uses that affect the marine environment. Specific activities may include, but are not limited to, education targeted at the general public, teachers, students, sanctuary users and environmental decision makers.

(2) The Secretary may undertake, either solely or in partnership with other persons, pursuant to an agreement under section 311 of this title, to develop interpretive facilities across the nation focused on marine resource protection. Such interpretive facilities will promote marine conservation by providing the public and specific user groups with innovative, focused and effective information about the nature, biological, ecological and social functions and values of sanctuary ecosystems.

Sec. 310. SPECIAL USE PERMITS

(a) ISSUANCE OF PERMITS.—

(1) The Secretary may issue special use permits which authorize the conduct of specific activities in a national marine sanctuary if the Secretary determines such authorization is necessary—

(A) to establish conditions of access to and use of any sanctuary resource or

(B) to promote public use and understanding of a sanctuary resource.

(2) The Secretary shall provide appropriate public notice when identifying specific activities subject to Special Use Permits under subparagraph (1).

(b) PERMIT TERMS.—A permit issued under this section—

(1) shall authorize the conduct of an activity only if that activity is compatible with the purposes for which the sanctuary is designated and with protection of sanctuary resources;

(2) shall not authorize the conduct of any activity for a period of more than 5 years unless renewed by the Secretary;

(3) shall require that activities carried out under the permit be conducted in a manner that does not destroy, cause the loss of, or injure sanctuary resources; and

(4) shall require the permittee to purchase and maintain comprehensive general liability insurance, or post an equivalent bond, against claims arising out of activities conducted under the permit and to agree to hold the United States harmless against such claims.

(c) FEES.—

(1) Assessment and Collection.—The Secretary may assess and collect fees for the conduct of any activity under a permit issued under this section.

(2) Amount.—The amount of a fee under this subsection shall be equal to the sum of—

(A) costs incurred, or expected to be incurred, by the Secretary in issuing the permit;

(B) costs incurred, or expected to be incurred, by the Secretary as a direct result of the conduct of the activity for which the permit is issued, including costs of monitoring the conduct of the activity; and

(C) an amount which represents the fair market value of the access to and use of the sanctuary resource and a reasonable return to the United States Government.

(3) Waiver or Reduction of Fees.—

(A) For activities that do not derive profit from the access to and use of sanctuary resources, the Secretary may waive or reduce any fees listed in subparagraphs (2)(A)-(C).

(B) The Secretary may accept in-kind services for fees described in subparagraph (2)(C).

(4) Use of Fees.—Amounts collected by the Secretary in the form of fees under this section may be used by the Secretary—

(A) for issuing and administering permits under this section; and

(B) for expenses of designating and managing national marine sanctuaries.

(d) VIOLATIONS.—Upon violation of a term or condition of a permit issued under this section, the Secretary may—

(1) suspend or revoke the permit without compensation to the permittee and without liability to the United States;

(2) assess a civil penalty in accordance with section 307; or

(3) both.

(e) FISHING.—Nothing in this section shall be considered to require a person to obtain a permit under this section for the conduct of any fishing activities in a national marine sanctuary.

Sec. 311. COOPERATIVE AGREEMENTS, DONATIONS, AND ACQUISITIONS

(a) COOPERATIVE AGREEMENTS, GRANTS AND OTHER AGREEMENTS.—The Secretary may enter into cooperative agreements, financial agreements, grants, contracts, or other agreements with States, local governments, regional agencies, inter-

state agencies, foundations, or other persons to carry out the purposes and policies of this title. Notwithstanding any other provision of law, the Secretary may apply for, accept, and use grants from Federal agencies, States, local governments, regional agencies, interstate agencies, foundation, or other persons, to carry out the purposes and policies of this title.

(b) USES OF RESOURCES OF STATE AND OTHER FEDERAL AGENCIES.—The Secretary may, whenever appropriate, use by agreement the personnel, services, or facilities of State or other Federal departments, agencies or instrumentalities, on a reimbursable or non-reimbursable basis, to assist in carrying out the purposes and policies of this title.

(c) AUTHORIZATION TO SOLICIT DONATIONS.—The Secretary may enter into such agreements with any nonprofit organization authorizing the organization to solicit private donations to carry out the purposes and policies of this title.

(d) DONATIONS.—The Secretary may accept donations of funds, property, and services for use in designating and administering national marine sanctuaries under this title. Donations accepted under this section shall be considered as a gift or bequest to or for the use of the United States.

(e) ACQUISITIONS.—The Secretary may acquire by purchase, lease, or exchange, any land, facilities, or other property necessary and appropriate to carry out the purposes and policies of this title.

Sec. 312. DESTRUCTION OR LOSS OF, OR INJURY TO, SANCTUARY RESOURCES

(a) LIABILITY.—

(1) Liability to United States.—All persons who destroy, cause the loss of, or injure any sanctuary resource or creates an imminent risk of destruction, loss of or injury to any sanctuary resource are jointly and severally liable to the United States for an amount equal to the sum of—

(A) the amount of response costs and damages resulting from the destruction, loss, or injury, including damages resulting from response actions;
(B) any costs related to seizure, forfeiture, storage or disposal arising from liability under this section; and
(C) interests on that amount calculated in the manner described under section 1005 of the Oil Pollution Act of 1990.

(2) Liability In Rem.—Any vessel that destroys, causes the loss of, or injures any sanctuary resource shall be liable in rem to the United States for response costs, seizure, forfeiture, storage and disposal costs, and damages resulting from such destruction, loss, or injury. The amount of that liability shall constitute a maritime lien on the vessel and may be recovered in an action in rem in the district court of the United States having jurisdiction over the vessel.

(3) Defenses.—A person is not liable under this subsection if that person establishes that—

(A) the destruction or loss of, or injury to, the sanctuary resource was caused solely by an act of God, an act of war, or an act or omission of a third party (other than an employee or agent of the defendant, or than one whose act or omission occurs in connection with a contractual relationship, existing directly or indirectly with the defendant), and the person acted with due care; or
(B) the destruction, loss, or injury was a direct result of activities—specifically authorized under Federal or State law or permit (excluding recommendations, instructions, or any other actions undertaken by the Secretary or any other person authorized to enforce this title in responding to an incident creating liability under this section), and the person was in compliance with such law or permit and acted with due care.

(4) Limits to Liability.—Nothing in sections 4281-4289 of the Revised Statutes of the United States or section 3 of the Act of February 13, 1893, shall limit the liability of any person or vessel under this title.

(b) RESPONSE ACTIONS AND DAMAGE ASSESSMENT.—

(1) Response Actions.—The Secretary may undertake or authorize all necessary actions to prevent or minimize the destruction or loss of, or injury to, sanctuary resources, or to minimize the imminent risk of such destruction, loss, or injury.

(2) Damage Assessment.—The Secretary shall assess damages to sanctuary resources in accordance with section 302 (9).

(c) CIVIL ACTIONS FOR RESPONSE COSTS AND DAMAGES.—The Attorney General, upon request of the Secretary, may commence a civil action in the United States district court for the appropriate district against any person or vessel that may be liable under subsection (a) for response costs, seizure, forfeiture, storage and disposal costs, and damages. The Secretary, acting as trustee for sanctuary resources for the United States, shall submit a request for such an action to the Attorney General whenever a person or vessel may be liable for such costs or damages. Venue is appropriate in the district in which the person is found or in which the destruction, loss, or injury to any sanctuary resource occurred.

(d) USE OF RECOVERED AMOUNTS.—Response costs, seizure, forfeiture, storage and disposal costs, and damages recovered by the Secretary under this section shall be retained by the Secretary in the manner provided for in section 107(f)(1) of the Comprehensive Environmental Response, Compensation and Liability Act (42 U.S.C. 9607(f)(1)), and used by the Secretary as follows:

(1) Response Costs And Damage Assessment Costs.—Funds recovered as reimbursement for past response, seizure, forfeiture, storage and disposal costs, and damage assessment costs under section 312(d) shall be used, as the Secretary deems appropriate, to reimburse the Secretary or other Federal or State agencies for response costs, seizure, forfeiture, storage and disposal costs, and the costs of undertaking damage assessments and to fund future response actions and damage assessments.

(2) Restoration, Replacement, and Prevention.—All other funds recovered under section 312(d) shall be used, in order of priority—

(A) to restore, replace, or acquire the equivalent of the sanctuary resources which were the subject of the action, including the costs of monitoring and the cost of curation and conservation of archaeological, historical and cultural sanctuary resources;

(B) to prevent threats of injury to or destruction of sanctuary resources within the national marine sanctuary that was the subject of the action;

(C) to manage and improve the national marine sanctuary that was the subject of the action, with priority given to restoring and protecting comparable resources and habitats; and

(D) to manage and improve any other national marine sanctuary, with priority given to restoring or enhancing injured or degraded habitats or resources.

(3) Federal-State Coordination.—Amounts recovered under this section with respect to sanctuary resources lying within the jurisdiction of a State shall be used under paragraphs (2)(A) and (B) in accordance with the court decree or settlement agreement and an agreement entered into by the Secretary and the Governor of that State.

(4) Statute of Limitations.—An action for response costs and damages under paragraph (c) of this subsection shall be barred unless such action is commenced within 3 years after the date of completion of the damage assessment and restoration plan prepared by the Secretary.

Sec. 313. AUTHORIZATION OF APPROPRIATIONS

There are authorized to be appropriated to the Secretary to carry out this title the following: (1) $29,000,000 for fiscal year 2000; (2) and such sums as are needed to fully implement this Act in fiscal years 2001, 2002, 2003, and 2004.

Sec. 314. U.S.S. MONITOR ARTIFACTS AND MATERIALS

(a) CONGRESSIONAL POLICY.—In recognition of the historical significance of the wreck of the United States ship Monitor to coastal North Carolina and to the area off the coast of North Carolina known as the Graveyard of the Atlantic, the Congress directs that a suitable display of artifacts and materials from the United States ship Monitor be maintained permanently at an appropriate site in coastal North Carolina. [P.L. 102-587 authorized a grant for the acquisition of space in Hatteras Village, NC, for display of artifacts and administration and operations of the Monitor National Marine Sanctuary.]

(b) DISCLAIMER.—This section shall not affect the following:

(1) Responsibilities Of Secretary.—The responsibilities of the Secretary to provide for the protection, conservation, and display of artifacts and materials from the United States ship Monitor.

(2) Authority Of Secretary.—The authority of the Secretary to designate the Mariner's Museum, located at Newport News, Virginia, as the principal museum for coordination of activities referred to in paragraph (1).

Sec. 315. ADVISORY COUNCILS

(a) ESTABLISHMENT.—The Secretary may establish one or more advisory councils (in this section referred to as an 'Advisory Council') to provide advice and recommendations to the Secretary regarding the designation and management of national marine sanctuaries. The Advisory Councils shall be exempt from the Federal Advisory Committee Act.

(b) MEMBERSHIP.—Members of the Advisory Councils may be appointed from among—

(1) persons employed by Federal or State agencies with expertise in management of natural resources;

(2) members of relevant Regional Fishery Management Councils established under section 302 of the Magnuson Fishery Conservation and Management; and

(3) representatives of local user groups, conservation and other public interest organizations, scientific organizations, educational organizations, or others interested in the conservation of sanctuary resources.

(c) LIMITS ON MEMBERSHIP.—For sanctuaries designated after the date of enactment of the National Marine Sanctuaries Program Amendments Act of 1992, the membership of Advisory Councils shall be limited to no more than 15 members.

(d) STAFFING AND ASSISTANCE.—The Secretary may make available to an Advisory Council any staff, information, administrative services, or assistance the Secretary determines are reasonably required to enable the Advisory Council to carry out its functions.

(e) PUBLIC PARTICIPATION AND PROCEDURAL MATTERS.—The following guidelines apply with respect to the conduct of business meetings of an Advisory Council:

(1) Each meeting shall be open to the public, and interested persons shall be permitted to present oral or written statements on items on the agenda;

(2) Emergency meetings may be held at the call of the chairman or presiding officer;

(3) Timely notice of each meeting, including the time, place, and agenda of the meeting, shall be published locally and in the Federal Register, except that in the case of a meeting of an Advisory Council established to provide assistance regarding any individual national marine sanctuary the notice is not required to be published in the Federal Register; and

(4) Minutes of each meeting shall be kept and contain a summary of the attendees and matters discussed.

Sec. 316. ENHANCING SUPPORT FOR NATIONAL MARINE SANCTUARIES

(a) AUTHORITY.—The Secretary may establish a program consisting of—

(1) the creation, adoption, and publication in the Federal Register by the Secretary of a symbol for the national marine sanctuary program, or for individual national marine sanctuaries;

(2) the solicitation of persons to be designated as official sponsors of the national marine sanctuary program or of individual national marine sanctuaries;

(3) the designation of persons by the Secretary as official sponsors of the national marine sanctuary program or of individual sanctuaries;

(4) the authorization by the Secretary of the use of any symbol published under paragraph (1) by official sponsors of the national marine sanctuary program or of individual national marine sanctuaries;

(5) the creation, marketing, and selling of products to promote the national marine sanctuary program, and entering into exclusive or nonexclusive agreements authorizing entities to create, market or sell on the Secretary's behalf;

(6) the solicitation and collection by the Secretary of monetary or in-kind contributions from official sponsors for the manufacture, reproduction, sale, or use of the symbols, including sale of items bearing the symbols, published under paragraph (1);

(7) the retention of any monetary or in-kind contributions collected under paragraphs (5) and (6) by the Secretary; and

(8) the expenditure and use of any monetary and in-kind contributions, without appropriation, by the Secretary to designate and manage national marine sanctuaries.

Monetary and in-kind contributions raised through the sale, marketing, or use of symbols and products related to an individual national marine sanctuary shall be used to support that sanctuary.

(b) CONTRACT AUTHORITY.—The Secretary may contract with any person for the creation of symbols or the solicitation of official sponsors under subsection (a).

(c) COLLABORATIONS.—The Secretary may authorize the use of the symbol described in paragraph (a) of this section by any person with which the Secretary is engaged in a collaborative effort to carry out the purposes and policies of this title.

(d) RESTRICTIONS.—The Secretary may restrict the use of the symbols published under subsection (a), and the designation of official sponsors of the national marine sanctuary program or of individual national marine sanctuaries to ensure compatibility with the goals of the national marine sanctuary program.

(e) PROPERTY OF UNITED STATES.—Any symbol which is adopted by the Secretary and published in the Federal Register under subsection (a) is deemed to be the property of the United States.

(f) AUTHORIZATION FOR NON-PROFIT ORGANIZATION TO SOLICIT SPONSORS.—

(1) The Secretary may enter into an agreement with a non-profit organization authorizing it to assist in the administration of the sponsorship program established under this section. Under an agreement entered into under this paragraph, the Secretary may authorize the non-profit organization to solicit persons to be official sponsors of the national marine sanctuary program or of individual national marine sanctuaries, upon such terms as the Secretary deems reasonable and will contribute to the successful administration of the sanctuary system. The Secretary may also authorize the non-profit organization to collect the statutory contribution from the sponsor, and, subject to subparagraph (2), transfer the contribution to the Secretary.

(2) Under the agreement entered into pursuant to sub-paragraph (1), the Secretary may authorize the non-profit organization to retain up to five (5) percent of monetary contributions it receives from official sponsors pursuant to such agreement, to offset the administrative costs of the non-profit in soliciting sponsors.

(g) PROHIBITED ACTIVITIES.—It is unlawful for any person—

(1) designated as an official sponsor to influence or seek to influence any decision by the Secretary or any other Federal official related to the designation or management of a national marine sanctuary, except to the extent that a person who is not so designated may do so;

(2) to represent himself or herself to be an official sponsor absent a designation by the Secretary;

(3) to manufacture, reproduce, or use any symbol adopted by the Secretary absent designation as an official sponsor and without payment of a monetary or in-kind contribution to the Secretary, or without prior authorization under paragraph (c) of this section; or

(4) to violate any regulation promulgated by the Secretary under this section."

Ms. YOZELL. Let me highlight five important features of the Administration's bill:

The bill clarifies the act's primary mandate for ecosystem protection. This includes protecting natural biodiversity and biological communities, instead of focusing, as we have in the past, on a species by species basis.

Second, the bill strengthens NOAA's ability to manage our sanctuaries as an integrated system, instead of focusing on 12 individual sites.

The legislation also reduces procedural burdens on the public and increases accountability when resources are damaged.

Fourth, the bill strengthens the system's research and education missions.

Finally, the bill authorizes increased funding of $29 million beginning in fiscal year 2000, which will enable us to fully and effectively manage our sanctuaries.

Let me now turn, if I could, to one of NOAA's successful partnerships. Earlier this year, with a $5 million grant from the Richard and Rhoda Goldman Fund, NOAA and the National Geographic Society launched the Sustainable Seas Expedition. This 5-year project of deep water exploration and public education in NOAA's sanctuaries is being led by Dr. Sylvia Earle, the National Geographic's explorer in residence.

Using newly designed DeepWorker submersibles, we will be mapping the biodiversity of all the Nation's marine sanctuaries. I would like to invite members of the Committee to participate in various expedition kickoffs. I know we are doing one next week in Boston up in Stellwagen Bank. In September we will be doing one in Texas on the Gulf at the Flower Gardens; and in Hawaii next year.

It is an amazing experience. I actually had the opportunity to go down in one of the submersibles myself and it was really something.

So, Madam Chair and the Committee, I urge and ask for the support for the Administration's reauthorization.

Now, if I could, I would like to turn my focus to coral reef conservation and, more specifically, to S. 725 and S. 1253. Many of our coral reefs are in crisis, as Senator Kerry and, Madam Chair, you stated earlier. We can no longer delay action. NOAA strongly supports comprehensive legislation that increases conservation and restoration of coral reefs and the coral reef ecosystem.

I want to commend Senators Snowe and Inouye for their leadership in this area. Both bills are powerful steps forward in addressing the coral reef crisis, and I pledge my willingness to work with the committee on these initiatives.

The U.S. has significant coral reefs in the southern Atlantic, Caribbean, Gulf of Mexico, and western Pacific, all of which have significant economic and social value. For example, reefs are the foundation of billions of dollars in economic activity through fishing and tourism. Approximately 50 percent of all federally managed fisheries species depend on coral reefs for some part of their life. Tourism related to coral reef systems has produced over $2 billion per year in both the Florida Keys and in Hawaii.

All of this is now at risk. Recent studies suggest that nearly 60 percent of the world's corals are seriously degraded by human activities and 10 percent of the reefs have already been destroyed. I have to tell you, these numbers are kind of soft. In fact, I wish I could give you a more comprehensive assessment of the situation in the United States. But unfortunately the data just does not exist.

We presently have no comprehensive program to monitor, protect, or restore the Nation's coral reefs. Our State and territorial partners, where 35 percent of the U.S. coral reefs reside, are in desperate need of maps and other tools and information and resources to implement coral reef monitoring programs, track the health of their reefs, and take actions to protect them.

Imagine, if you would, trying to manage our national forests or make land use decisions at the local level without maps showing where the resources are or what condition they are in or what they are being used for. This is our current situation when it comes to coral reefs. Local, State, and Federal managers have to make tough decisions every day without some of the most basic information.

Last year at the National Ocean Conference President Clinton signed an executive order creating the U.S. Coral Reef Task Force. It is made up of Federal agencies, States and territories who are developing a national action plan, and they prioritized the threats to the reefs. If I could, let me just highlight a few of those.

They agreed to launch a comprehensive effort to map and assess the U.S. coral reefs in the Pacific, to establish a coordinated network of coral reef protected areas, to implement a coordinated reef monitoring program, to build emergency response capabilities and strengthen local and regional efforts by supporting the U.S. Islands Coral Reef Initiative. All of these are parts of the legislation that you have introduced.

Now, NOAA's part of the Lands Legacy Initiative includes $12 million to directly support these actions and to begin to fulfill the executive order.

S. 725 and S. 1253 both propose authorizations for important new resources to address the coral crisis. Both bills would establish a competitive program to make resources available to government and nongovernment entities at local, State, and territorial levels where direct actions can be taken. We support the focus of these programs toward on the ground efforts such as assessment, monitoring, management, education, and restoration, as well as the matching requirements and leveraging of Federal dollars. Local level actions and public-private partnerships are effective means for coral reef conservation and restoration.

S. 1253 includes some necessary additional elements to address aspects of the coral crisis. It recognizes the need to support Federal efforts to conserve and restore coral reefs. NOAA, for example, has the tools, knowledge, and experience to assist States and territories in managing their coral reefs.

S. 1253 also includes a provision designed to help prevent the destructive and dangerous practice of abandoning vessels on U.S. reefs, and we would like to work with the Committee to review additional measures which may be necessary in this area.

Finally, S. 1253 authorizes the necessary level of appropriation to begin to address coral protection.

I would like to reiterate the Administration's strong support for comprehensive legislation that increases conservation and protection of coral reefs. S. 725 and S. 1253 are both important steps forward. I look forward to working with you and the Committee to ensure passage of good legislation in this area.

So in conclusion, Madam Chair and Committee members, I applaud the Committee's leadership and the commitment to protecting our resources and the communities and economies that depend on them, and I look forward to working with you and all of these areas.

Senator SNOWE. Thank you, Ms. Yozell.

Let me start with what should be the focus in coral reef conservation efforts. My legislation, as well as Senator Inouye's legislation, includes local conservation programs and grants to create an impetus for local participation, perhaps that will enhance the sustainability of some of these programs. That is why I included a 50 percent match. I want to discuss that with you in a moment.

But let us first talk about the most urgent unmet need with respect to coral reef conservation. Is it still local participation and local conservation efforts that is the largest unmet need at this point?

Ms. YOZELL. There are so many unmet needs, I do not know if I would say that is the largest unmet need. Without a doubt, in order to address these issues we do have to work with the local communities and at the local level. For example, polluted runoff is one of the—and other water quality issues, are one of the No. 1 issues that are affecting the coral reefs, the health of the reefs. I have got to say that if we do not work with the local communities to figure out how to address these issues that is going to be a major problem.

The other issue, though, that we learned recently, and I was surprised—that was when we had the task force meeting in Hawaii—is mapping. Less than 10 percent of the U.S. coral reefs have been mapped to date. Most mapping has been in the Florida Keys. So in order to develop a regime of management and monitoring and protection, we really first need to know where they are and what condition they are in. That is why mapping plays such a key role there.

We can work with local communities and State-level folks to do that mapping, but I would say mapping, water quality, fishing activities, and education and outreach are really the most important issues, and they can all be done at one level or another through local, State partnerships.

Senator SNOWE. Isn't capacity-building important? Working on the local level through the grant program to get everybody involved, will enhance the sustainability of the project through a matching program. I happen to think that once people have a stake in a local project that it will encourage long-term participation.

It seems to me from all that has been said on this subject that there needs to be more of this kind of local participation.

Ms. YOZELL. Capacity-building without a doubt is very, very important, and we do need to get buy-in at the local communities. However, I will note when you look to some of the island territory areas they may not actually have the funds to be able to do the match. I recognize in your bill you provide for in-kind as well, as one of the matches when appropriate.

Capacity-building at the local level is very, very important. But sometimes they do not have the tools or the expertise. They are willing to do it, they are willing to learn. That is where having a national program to be able to enhance what is going on at the local level is very important.

Senator SNOWE. Some of these grants were a one-time event rather than a sustainable, long term and ongoing project. Therefore, through a match program you are more likely to achieve that.

Now, of the grants issued in 1997, I understand there were about 20 that were under $25,000. Do you know how many of those projects exist today?

Ms. YOZELL. Well, those grants that you are referring to are through the National Fish and Wildlife Foundation and they are very, very small, on-the-ground grants. I do not know off the top of my head if they are ongoing. I would assume many of them are because we have a coral program with the National Fish and Wildlife Foundation, and I assume that if they prove successful then these local folks applied for a second round. I can get that information for you, though, specifically.

[See Administration's prepared responses for the record.]

Senator SNOWE. I would be interested. I would like to know exactly how many are still under way today.

You said in your statement that NOAA has no funding to specifically address the coral crisis. According to a summary provided by your staff, NOAA spent $13 million in coral programs last year.

Ms. YOZELL. That is correct.

Senator SNOWE. So what did you specifically spend money on if it was not spent on the coral crisis?

Ms. YOZELL. Well, I do not know if I said "no," then I erred in the no. But let me say it is merely a drop in the bucket. The $13 million that NOAA has been spending is primarily on research. For example, we have the national undersea research program which we will be hearing more about from the Caribbean Center today, and the aquarius undersea research program in Florida Keys, and in Hawaii the undersea research program there.

The sea grant program also spends some money on research. Then with the fishery management councils, they have been providing or trying to get up to speed to develop fisheries management plans affecting corals. They are way behind in their efforts, and in fact WestPac, which is the Western Pacific Fishery Management Council, has come to the Senate requesting more money just to address corals.

So we have got a little bit going on here, it is really just the beginning and just scratching the surface of the problem.

Senator SNOWE. Well, you mentioned on page 15 of your prepared statement that NOAA has no funding to specifically address the coral crisis at this time. So the money that is being funded in this table that says "Summary of funding for coral reef activities" is not addressing the crisis, or is it providing minimal funding in each of these programs?

Ms. YOZELL. I would say I obviously must have erred in "addressing the crisis." We are scratching the surface of the crisis. We are definitely losing the battle with $13 million funding this. We are not achieving any kind of major success in preventing the destruction of our corals.

Senator SNOWE. In Senator Inouye's bill he includes a provision on revoking the Jones Act eligibility if a ship that is abandoned on a coral reef. Do owners of ships that are abandoned on coral reefs pay for any damages? Do we have instances where they do not pay for the damages and still maintain their eligibility to participate in the Jones Act trade?

Ms. YOZELL. Well, I think the problem, the specific issue that we are focusing on there, is the abandoned vessels in American Samoa. All of those vessel owners have gone into bankruptcy and were unable to pay for any kind of corrective measures to restore the reefs.

We do have a damage assessment program where when resources are harmed, for example corals are harmed in the sanctuaries, we are able to go after them. But like all damage assessment, if they are bankrupt and cannot pay, they cannot pay.

I think the effort—and I would have to check with Senator Inouye's folks—that they are trying to do there is if a shipowner goes into chapter 11 and then tries to startup elsewhere, they should not be able to do so without first owning up to their responsibility of damaging the resource.

Senator SNOWE. Yes, and do we have any current examples?

Ms. YOZELL. I do not, no. But again, I would be happy to get back to you and double check on that.

[See Administration's prepared responses for the record.]

Senator SNOWE. So it is possible they could maintain or regain eligibility?

Ms. YOZELL. I think it is possible that they can.

Senator SNOWE. They could become eligible again to compete in the for Jones Act trade even if they filed bankruptcy and then they started again?

Ms. YOZELL. I believe that is what they are trying to address.

Senator SNOWE. But you do not know of any instances in which that has happened?

Ms. YOZELL. I personally do not know of any instances. But I can check that out easily. It must be an issue.

Senator SNOWE. I would appreciate that. I would like to have that information before the Committee.

Ms. YOZELL. Sure.

Senator SNOWE. Thank you.

Senator Kerry.

Senator KERRY. Just a couple of quick questions.

Ten years ago the Bush Administration had an expert panel that said the sanctuary program needed a minimum of $30 million in annual funding. The program has been funded at only half that amount, and that was before we added six new sites to the program.

Therefore, you now say or the Department says that one-third of the twelve sanctuaries have reached a "baseline operational level." What do you consider a baseline operational level to be?

Ms. YOZELL. When we talk about a core level we're merely talking about a manager, an education outreach coordinator, a scientist, and some support staff. We also look to perhaps have a multi-purpose vessel at each sanctuary where appropriate. We also look to have them be part of—a sanctuary advisory committee. Only 7 of the 12 sanctuaries currently have local advisory committees.

Then third, we are trying to get to a point where we can develop a management program where every 5 years we can have a strong management plan, review it, and implement changes to it.

Some of our sanctuaries have as little as a couple hundred thousand dollars as their annual operating level, hardly enough to manage the vast resources that they are trying to protect.

Senator KERRY. Is there a showing of any detriment to those sanctuaries as a consequence of that?

Ms. YOZELL. Absolutely. We have issues going on throughout the sanctuaries that, one, we are either not aware of because we cannot monitor it or we do not even have a baseline assessment of the biodiversity that exists in most of our sanctuaries.

We have these things called site assessments and we have only finished 1 in all 12 national marine sanctuaries and that was at the USS Monitor, which it is pretty easy to go down and do the site assessment for a ship. But on the actual resources, the vast resource of the Hawaii Humpback Whale Sanctuary, Stellwagen Bank, and others, we do not have a baseline understanding of what exists there.

Senator KERRY. Will the current request of $29 million bring each of the sites up to the baseline as you have defined it?

Ms. YOZELL. Yes, it certainly will be a good start. I mean, it is not going to happen in 1 year, but we believe that level of funding over several years is going to bring us to the level we need to get to, and then move on to make further improvements.

Senator KERRY. So we only have one site that currently has any kind of baseline assessment?

Ms. YOZELL. Full baseline assessment, and it is the USS Monitor, which is a ship.

Senator KERRY. Can you share with the Committee any of the specific shortfalls with respect to the mission as defined at any of the other sites? You can submit it to the Committee.

Ms. YOZELL. Let me submit a list for the record.

Senator KERRY. I would like to see an assessment of that. I would like to see exactly what your assessment is of the deficiencies/shortfall at those sites due to lack of funding.

Ms. YOZELL. Let me give you an example. I am so overwhelmed with how many there are, it is hard to even begin to focus. But looking at Florida Keys for example, there we have been asked to do a comprehensive water quality management and monitoring program. We know that a place like the Keys, where the land is made of porous coral, and water quality is so important to the adjacent coral reefs, pollution runs through the land. In the past week there have been examples of beaches being closed around the Key West area due to poor water quality.

That sort of thing happens frequently down there and we are not able to get a handle on it because we do not have the funds to address it.

Senator KERRY. Well, I think it would be really good to have that assessment in terms of any kind of advocacy or struggle for funding, rather than being abstract. I think that creates a little more specificity.

With respect to the coral reefs in the last years, you have estimated expenditures over 3 years, 1997, 1998, 1999, of $10 million, $12.1 million, and $13 million. How does that compare to the recommendation of the Coral Reef Task Force?

Ms. YOZELL. The current spending or what we have requested?

Senator KERRY. What you have spent.

Ms. YOZELL. Again, it really is a drop in the bucket, as I said earlier to Senator Snowe. We have huge requirements that the Task Force is trying to undertake. We are putting together budgets that will be available for 2001, but in just our preliminary Task Force meeting NOAA was able to come up with its $12 million request added to the $13 million that we already have.

We fine-tuned the budget more after our first Task Force meeting when we recognized that we have to assess what the status of the coral reefs are, develop management programs, and then monitor them as well as map them. There are so many stressors focusing on our coral reefs, as I said, water quality, fishing, marine debris, and in order to handle all these issues $13 million is just not enough to do it.

Senator KERRY. If adequately funded, how long would it take to map all the coral reefs?

Ms. YOZELL. If adequately funded, it would take about 5 to 7 years to fulfil our efforts of mapping.

Senator KERRY. That is at an annual funding of what level?

Ms. YOZELL. That would be at the annual funding level that NOAA is requesting, $12 million. And not all of that money would be used for that, but that would probably be a few million dollars a year. Without the money, Senator, I am not sure we will ever get it done. If we go at the rate we are going, it could be 20 or 30 years from now.

Senator KERRY. Thank you very much.

Senator SNOWE. Senator Breaux.

Senator BREAUX. Thank you, Madam Chairman. I thank the witness.

I think we ought to have a field hearing in an underwater submersible on top of a coral reef.

Senator SNOWE. That would be interesting.

Ms. YOZELL. I would love to take you all down.

Senator BREAUX. We are going to do it. I was looking at Yachting Magazine, I guess, in June. Actually, what attracted my attention to the magazine was the 41-foot Sea Ray on the cover, but I did notice that in the magazine was an article "Who's Killing the Coral Reefs in Florida?," which you have seen.

There seems to be some sort of argument, which I was surprised to learn, that part of the problem is the increase in the salinity in the area around the coral reefs. Others have said, no, it is the increase of fresh water and all the nitrogen and phosphorus; it destroys the oxygen and causes the gradual destruction of the reefs.

Is there any doubt what is causing it with regard to nitrogen and phosphorus?

Ms. YOZELL. Senator, you bring this up at a rather timely point. Later this week, in fact tomorrow I guess, we will be announcing a major restudy of the South Florida Everglades Restoration in that NOAA has a key role to monitor the coral reefs in the Florida Keys. As we are re-plumbing the whole Everglades and the whole water quality as well as salinity and non-salinity and other changes, we are going to be monitoring very closely to see how that affects the reefs.

The reason we are doing that is because that is the No. 1 issue there. Water quality is probably the most important issue when it comes to the Florida Keys.

I would like to further note on your initial comment, we would love to invite you to come down and dive on the Keys.

Senator BREAUX. I accept. [Laughter.]

Ms. YOZELL. We would love you to come down and give you sub training, which we will be doing in August.

Senator BREAUX. I accept.

Ms. YOZELL. There you go. We will work with your staff to make sure that we get to do that.

Senator BREAUX. Well, we have talked with the Chairwoman of the Subcommittee, my good friend from Maine, about the problem we have in the Gulf of Mexico with regard to the dead zone that occurs every summer: we have 7,000 square miles utterly without oxygen. We also have the Flower Garden Banks which I remember helping authorize back in 1972 as a marine sanctuary.

I think the consensus of scientists there is that it is the nitrogen and phosphorus that are being dumped into the Gulf of Mexico that allows the algae to grow very rapidly. When the algae dies off, it destroys the oxygen content, thereby destroying the coral reefs. Is there any doubt that that is not the same problem that is occurring in the Florida Everglades?

Ms. YOZELL. I believe it is. Let me turn to our coral scientist, Mike Crosby.

Dr. CROSBY. Senator, I think you are hitting the nail on the head in terms of one of the perturbations. The nitrogen is certainly, and phosphorus, certainly acting the way that you described it.

Senator BREAUX. So it is really the influence of fresh water into this ecosystem that creates part of the problem?

Dr. CROSBY. It is the combination of all of these factors.

Senator BREAUX. Rank in general terms the causes of the deterioration of the coral reefs. Obviously anchoring, someone anchors on top of a coral reef and rips it up, is a problem. Is the anchoring and everything else part of it a potential problem? Is people breaking off the coral reefs to sell in shops a problem? What about the algae and the lack of oxygen?

Give us a ranking of what seems to be the current major reason for the problems that the coral reefs are having?

Dr. CROSBY. The significance of the perturbations is dependent upon the site. In the Florida Keys water quality is obviously a major, major factor. In some of the more isolated reefs in the Pacific, for instance, water quality would not be, but perhaps nets from various fishing vessels that have washed aground on the atolls may be a problem, coral bleaching is definitely a problem.

Senator BREAUX. Coral bleaching is caused by what?

Dr. CROSBY. Well, actually high temperature is one of the drivers. There's a good strong correlation there. The actual physiological mechanism for the expulsion of the symbionic algae which is causing the bleaching, the overhead that Senator Snowe had up there, the exact physiological mechanism is being studied right now. There is some new evidence that may indicate that it is actually a vibriobacteria that is causing the disruption of the physio-

logical processes of the phytoplankton itself, causing them to be expelled or to die.

But depending on what reef you are at, there are different stressors, and it is not any one stressor that you can point your finger to.

Senator BREAUX. How much damage is caused by human involvement—actual contact with the reefs and breaking them up?

Dr. CROSBY. Significant in areas where there is a large degree of tourism. Some of the tourist areas in Hawaii get a lot of damage from people because there is not an adequate amount of education and outreach for maybe tourists coming into an area. They may step or walk or throw their anchors overboard.

Florida Keys is doing a very good job with respect to education and outreach, but again that is only 325 square kilometers of a total of about 17,000 square kilometers of coral reefs in the U.S.

Senator BREAUX. How many of the coral reefs are not in marine sanctuaries within the economic zone of the U.S.?

Dr. CROSBY. The overwhelming majority.

Senator BREAUX. Are in?

Dr. CROSBY. Are not in.

Senator BREAUX. Are not in the sanctuaries?

Dr. CROSBY. Yes, sir.

Ms. YOZELL. 90 percent of the corals are in the Pacific and just a small amount of that is actually in the humpback whale sanctuary.

Senator BREAUX. I was talking about in areas where we have the authority to put them in a sanctuary, within the 200 mile economic zone of the United States.

Ms. YOZELL. That is the 90 percent.

Senator BREAUX. Really?

Ms. YOZELL. YES.

Senator BREAUX. So 90 percent are not in marine sanctuaries?

Dr. CROSBY. I would say over 90 percent are not in sanctuaries, yes, sir.

Senator BREAUX. Now, those that are in marine sanctuaries, are the tools available for us to adequately protect them within the sanctuary? I would think they are.

Ms. YOZELL. We have adequate tools within the sanctuary. We have broken some of the most incredible ground in the Florida Keys National Marine Sanctuary. I think you will hear in a few minutes from Mike Collins and he will talk about where we were with the Florida Keys Sanctuary as a first. It was the first sanctuary ever to have zoning. It was the first sanctuary ever to have a water quality program. It was the first sanctuary ever to have a sanctuary advisory committee.

All of these things were sort of problematic as we broke major new ground in trying to manage such a vast resource. Today, however, we have learned so much from this process.

Another place I would love to get you to dive is the Tortugas 2000—I mean Tortugas, and we are creating a program called Tortugas 2000, where we are going with the national park, the State, our dive community, our fishing community, and we are all working in concert at the local level to be able to create a large, 180 square mile ecological reserve. That is a no-take zone.

Senator BREAUX. That is in the 200 mile exclusive economic zone?

Ms. YOZELL. Yes, it is. And it is gaining incredible support throughout the community and it is getting that kind of support because we have been working with the stakeholders, and it has just been a real good example of what we learned from our initial efforts in the Florida Keys as we developed protective measures.

Senator BREAUX. I do not want to belabor this too long, Madam Chair, but let me ask if the coral is out in the Tortugas, I guess the fresh water intrusion—with nitrogen and plex-plains is not a problem in that area is it?

Dr. CROSBY. Actually, some of the current information, "current" as in water current information, indicates that actually some of the waters that are coming out of the Mississippi and are creating the dead zone up around Louisiana are actually coming down and impacting the Florida Keys as well. You will also be getting impacts, potential impacts, coming out of the Florida Bay area.

Senator BREAUX. Are the destruction of the corals in the Tortugas and further out toward the east in the Caribbean similar to the type of problems and destruction that you are having in the Keys, or is it different?

Dr. CROSBY. Similar in many ways, because of the human—the high density of human beings—in the Caribbean in association with coral reefs. There are a lot of similarities, yes.

Senator BREAUX. Well, I really want to work with you. The good news is you have got Democrats and Republicans both offering a bill on corals. I mean, what are we headed for? This is unbelievable. We are arguing about who is going to put the most money in it, which is really a wonderful argument to be having. So at least we are moving in the same direction, and I would hope we could all come together.

I have just got one final question. It is sort of a technical thing, but I have a memory of this. The Flower Garden Banks background information—I do not know if this is from NOAA or from who—says: "Flower Garden Banks is one of the 12 national marine sanctuaries designated under the Marine Protection, Research, and Sanctuaries Act of 1972." Then it says further down: "Flower Gardens Banks was designated in January 1992."

I remember designating it in 1972. It was not 1992. It has been designated as part of the national marine sanctuaries since 1972, has it not? Was it something different in 1992 that was done that I do not remember? I mean, I authored the legislation back in 1972. I remember that.

Ms. YOZELL. I will tell you why it took so long.

Senator BREAUX. It is sort of a technical question. It is not really important.

Ms. YOZELL. Apparently we started it and then there was a "hiatus."

Senator BREAUX. A 20-year hiatus?

Ms. YOZELL. It gained a lot of support to become a sanctuary, so we started again and with that support we made it one.

Senator BREAUX. Good things take a long time.

Thank you.

Ms. YOZELL. It is tremendous—that is my next goal, to go there. From what I have heard, it is a tremendous sea mount that is just so unique.

Senator BREAUX. It is the northern most shallow water coral reef in North America.

Ms. YOZELL. Yes. Not to belabor the point, but that adds to the reason why we so badly want to create visitor exhibitry centers or whatever. I believe it is something like 60 miles off the coast. It is not the sort of thing that, like a national park where people can drive in and participate.

Senator BREAUX. In fact it is about 110 miles, so it is even further than that.

Ms. YOZELL. But that even furthers the reason that we really need to get our communities and visitors to understand what is out there in the deep, so that they can protect and learn to appreciate the resources.

Senator BREAUX. Thank you.

Thank you, Madam Chairman.

Senator SNOWE. Thank you, Senator Breaux.

Has your agency identified national priorities with respect to coral reef degradation? You mentioned mapping, and I assume that that has been an existing problem. Is it a result of a lack of funding? Has the agency gone through a process of identifying what is absolutely essential and made a forceful case to Congress over the years with respect to this issue?

Ms. YOZELL. I would say no, we probably have not made a forceful case over the years. That is why—first you had the islands report which identified it at the local island level of what really needed to be done. At the National Oceans Conference last year, that was why President Clinton created this task force, the Coral Reef Task Force, to really bring all that together.

In doing so, I think it really helped NOAA get its house in order with regard to what its priorities are for corals. Again, water quality, fishing, mapping, those are the sort of issues that we really need to address.

Senator SNOWE. Will the Coral Reef Task Force come up with a plan and identify those priorities?

Ms. YOZELL. Yes.

Senator SNOWE. They will?

Ms. YOZELL. Yes. We have already begun to do so and it is due out in October.

Senator SNOWE. This morning there was a report on global warming that mentioned the fact that in the next 100 years the temperature could increase by 7 degrees. What would that mean to the problem at hand with respect to coral reefs? Are there any efforts under way or planned to prevent further degradation of coral reefs? Obviously, some efforts have been developed, but have we taken a major step toward preventing further degradation of coral reefs if global warming does increase over the next 100 years?

Ms. YOZELL. I am going to start this and then I am going to turn it over to Michael for the more accurate response. But my understanding is with coral bleaching that often the reefs can come back after a warming spell. However, when you add a lot of stresses to the corals they are weakened, and something like a coral bleaching

event due to, if it is climate change, global warming, whatever, make it far more difficult for it to be able to recover.

Senator SNOWE. Can you reverse coral bleaching?

Dr. CROSBY. It can be reversed if it does not occur over an extended period of time and the water temperatures go back down within the normal range. There are many, many cases of the coral developing—renewing the relationship with the symbionic algae. But if it goes for an extended period of time, there are also many cases that show that the coral does die.

Ms. YOZELL. But I also believe—correct me, Michael—if it is in a weakened state due to other diseases, pollution, too much algae or whatever, it has less of an opportunity to be able to come back from a coral bleaching event than maybe otherwise if it were totally a healthy reef.

So when you say are we doing anything for the future, I think we are trying to develop ways to make sure that the existing corals are as healthy as possible so they can survive these kind of events.

Senator SNOWE. What percentage of the reefs are in the northwest Hawaiian Islands?

Ms. YOZELL. Of all——

Dr. CROSBY. The northwest Hawaiian Islands I think have a little over 60 percent of all.

Senator SNOWE. Do they suffer the same impact?

Dr. CROSBY. With respect to global warming?

Senator SNOWE. Yes.

Dr. CROSBY. With respect to temperature increases, yes, ma'am. They probably are a little bit less impacted than say the Florida Keys with respect to tourism.

Senator SNOWE. Because they are not populated?

Dr. CROSBY. They are a little less accessible, although there is a growing ecotourism activity in the Hawaiian Islands. People want to go where the coral reefs are most beautiful. In fact, like moths being drawn to a flame, sometimes the relationship ends up not being mutually beneficial.

Senator SNOWE. On the National Marine Sanctuaries Act, you mentioned earlier the implementation of the management plans. So not 1 of the 12 sanctuary programs' management plan has been implemented, is that correct?

Ms. YOZELL. No, no, no, no. I was talking about the site characterizations.

Senator SNOWE. OK.

Ms. YOZELL. With regard to the management plans, all of the sanctuaries have a management plan.

Senator SNOWE. They have a management plan, but they have not been implemented and updated?

Ms. YOZELL. No, they are being——

Senator SNOWE. They have?

Ms. YOZELL. Oh, updated, now that is another story. Every 5 years we are supposed to update the management plans, and we have just begun to do that. We started with Stellwagen Bank a few months ago with scoping and what-not.

Senator SNOWE. All 12 management plans have been fully implemented?

Ms. YOZELL. They are fully written. We are not able to implement them.

Senator SNOWE. Well, that is what I am talking about, the actual implementation.

Ms. YOZELL. No, we are not able to implement them. That is the whole core staffing level issue that I was discussing earlier.

Senator SNOWE. Right. But they have been in place for how long, for 5 years or 25 years?

Ms. YOZELL. Well, no. They vary from site to site because they have all come on line at different times.

Senator SNOWE. Yes, because of different times. But not one of them has been fully implemented over the course of time?

Ms. YOZELL. No, no, no. The site characterization at every——

Senator SNOWE. I know that every site has a management plan.

Ms. YOZELL. Yes.

Senator SNOWE. That's not the question I am asking. Have they or have they not fully implemented the management plans?

Ms. YOZELL. I believe they have.

I will turn it over to——

Mr. LINDELOF. Madam Chairwoman, they are living documents that are revised as we go along, but periodically every 5 years. None of the sites are currently fully implemented. We are in the process of doing that, and that is where the Lands Legacy increase becomes significant.

Senator SNOWE: So not one of the plans has been fully implemented. I have been told that they have not been updated either.

Mr. LINDELOF. That would be correct.

Senator SNOWE. They have not been reviewed and updated.

Mr. LINDELOF. That is correct. When a sanctuary is designated there is a management plan as part of its designation. That management plan lays out an education program, research program, an enforcement program, and how that sanctuary is going to be managed. It contains a list of activities.

What we have been able to do in most sites is partially implement, with the current funding, the sanctuary activities. None of the sanctuaries have completely had a revision of their management plan, nor are they fully implemented.

Senator SNOWE. So what would it take to do both?

Ms. YOZELL. That is the whole point in our reauthorization.

Why don't Ed stay here just in case. This is Ed Lindelof, who is currently the Acting Manager of the Stellwagen Bank Sanctuary, but works here in Washington.

Senator SNOWE. The $29 million would be for reviewing and implementing?

Ms. YOZELL. Both.

Senator SNOWE. Both. So the $29 million would do both?

Ms. YOZELL. The $29 million—it is not going to happen in 1 year, but it is the starting point so that we can get all of our sanctuaries to the core operating level where we can implement management strategies, do site evaluations, and then, further, start to begin this 5-year review period, which is quite extensive. We go out to the communities, as we just did in Massachusetts in Stellwagen Bank, and have public hearings and work with our sanctuary advisory

councils to determine what are the important management regimes we need to put in place, and then put them in place.

Senator SNOWE. None of the management plans have been updated?

Ms. YOZELL. Correct, none of them have been updated. Stellwagen Bank was the first to begin to be updated.

Senator SNOWE. So what does that process take?

Ms. YOZELL. It takes, as I just said, it is starting with going out——

Senator SNOWE. But how long?

Ms. YOZELL. Eighteen to 24 months.

Senator SNOWE. Eighteen to 24 months. And the reason why they have not been fully implemented, is due to the lack of funds?

Ms. YOZELL. That is correct, and updated.

Senator SNOWE. For lack of funds?

Ms. YOZELL. Both, because you cannot really go out and update if you do not have staff or scientists or managers or anyone to go out and do this kind of work.

Senator SNOWE. Obviously, it is required under the law. Why hasn't NOAA done it over the years?

Ms. YOZELL. NOAA has not had the funds to do it over the years.

Senator SNOWE. Have they made a case for that?

Ms. YOZELL. We have certainly tried.

Senator SNOWE. I cannot imagine after all these years that no one was hearing or listening in Congress.

Ms. YOZELL. We find that hard to believe as well.

Senator SNOWE. I know. It is a shock to hear you say that.

Ms. YOZELL. I have to say, I think this is truly the year of the national marine sanctuary, and that is why we are very pleased with working with the committee to ensure that we succeed.

Senator SNOWE. So NOAA has established priorities for the implementation of plans?

Ms. YOZELL. Yes.

Senator SNOWE. Updating?

Ms. YOZELL. Yes.

Senator SNOWE. How about expansion of the program? Does that take away from doing either of those tasks?

Ms. YOZELL. At the moment NOAA has no plans to expand its existing sanctuary program.

Senator SNOWE. Other than the most recent one in Michigan.

Ms. YOZELL. Right, exactly.

Now, I will note the House bill, for example, tries to put a cap on any kind of expansion and that is our plan at the moment. But if the State of say Maine or Alaska or Louisiana wanted to paint a really good case why we ought to have a sanctuary off its coast, we would not want to be able to prohibit that if it was a worthy cause.

Senator SNOWE. How about enforcement? I know there has been an issue concerning lack of enforcement. In the administration's bill and the House bill new criminal penalties are proposed. How will that work if we are unable to enforce the current law?

Ms. YOZELL. Enforcement is also part of the getting our core staffing levels up to speed.

Now, with regard to criminal, I want to make that clear. The criminal part of that is just for individuals who harass the enforcement officials. It is not to create penalties, and I want to make sure that that is understood.

Senator SNOWE. Are the current civil penalties enforced?

Ms. YOZELL. It is very spotty. We do not have enough enforcement capability. In the Florida Keys, where we probably have our greatest enforcement, we have a dual enforcement with the State. It is very effective. We do not do that many penalties unless it is a major case. Many of our officers are out there more to educate and provide warnings and really educate the population.

But if it is an egregious event, they are there to do the enforcement. But it is under, under, under capacity with regard to the other sanctuaries.

Senator SNOWE. Also, has your agency noticed greater pressure outside the sanctuary with respect to fishing and other activities?

Ms. YOZELL. Well, fishing is permissible within the sanctuaries and many of the activities. So except for the few no-take zones which we have in Florida, that has really not been the case. In fact, I think as Mike Collins can tell you later, in the Florida Keys the fishermen have really embraced a lot of the areas of no-take zones, because they are very, very rich biodiversity areas which are creating more fish outside of the no-take zones.

Senator SNOWE. Right, and in Florida they have a number of no-take zones. But has there been any attention placed in those areas where the pressure might be greater?

Ms. YOZELL. We have not noticed it. I really believe that it is an effective tool for assisting the fishing community and the dive community outside of those areas. I do not think the level of fishing has increased.

Senator SNOWE. Do you think it is publicly known that there are compatible uses of the sanctuary? Is that a widely known concept?

Ms. YOZELL. I think that is a mixed bag. I think some people believe that it is the heavy hand of the government, and others who are living and working and closely understand the sanctuary understand that it is mixed use. I think that is why again in our request we are trying to much harder to get the education and outreach component fulfilled.

Senator SNOWE. Right, and I think that it is important for the agency to get that message out, because it would minimize the adversarial relationship that might develop between the communities and the agency with respect to operating a sanctuary.

I noticed in the testimony of Mike Collins, who we will be hearing in the next panel, his comments on the process in Florida involved in developing a sanctuary management plan. It became controversial and then the plan disappeared, he said, "in the Beltway for a year." The agency provided, I gather, a less than objective and open process at that point. It did not encourage this type of openness that is critical.

I really think that it is absolutely essential, otherwise, no matter how well intended a plan or effort is on the part of the Federal Government, if it is not well understood the motivations are second-guessed, or other new issues develop that have not been sub-

ject to a public process, and you are clearly going to have some serious problems overcome.

Fortunately, it did not cause the plan to fail, in the final analysis and Mr. Collins supports it. But he is saying that we always have to have an open public process, and I would certainly encourage that.

Ms. YOZELL. Madam Chair, you are 150 percent right on when it comes to that.

Senator SNOWE. It is about the only time, but that is all right. Thank you. People do not often say that.

Ms. YOZELL. We have learned so much through our experience in the Florida Keys National Marine Sanctuary. I want to if I could pass to you—this is an advertisement that has been done by the Monroe County Development Council supporting the sanctuary and the no-take zones and all of the things that people were so paranoid about initially. The Chamber of Commerce is doing it, CNN is running ads.

The more open the process, the better the consequence. That is what we are doing in this Tortugas 2000 effort, where we are making 180 square miles of area an ecological reserve. The openness has made—it is just like night and day, the difference in our ability to accomplish this.

Senator SNOWE. Well, I appreciate your testimony on this issue, and I intend to work with you and others in the agency. I will be drafting legislation on the reauthorization of the Sanctuaries Act and I am going to take into account many of the issues here today, as well as your comments on the Coral Reef Conservation Act.

On another matter that I want to raise, and I suspect you probably anticipated it, concerning the New England Fisheries Management Council decision, I have to register my opposition to the Secretary's recent decision. I want to be sure that everybody in your agency understands my very strong dissatisfaction with what happened in wresting from the State of Maine one of its at-large seats on the Fisheries Management Council. Since your agency is responsible for the council, I wanted to make sure you understand. I did raise this yesterday with Dr. Baker.

But I have to tell you how unhappy not only I am, but the people who are subject to the decisions made by the council. Maine fishing communities lost that seat to the State of New Hampshire. What I am saying here is that those seats have been proportional. Maine has had two at-large seats since the inception of the council. Just as Massachusetts has had three seats, Maine has had two at-large.

We have 3,500 miles of coast line. The State of New Hampshire has 11. So that is one representative for every 3.7 miles and we have one representative for every 1,167 miles—we also have 25 times the industry as in New Hampshire.

I am not trying to pit one State against another. There was a very good reason for that proportionality on the at-large seats on the council. What it is going to do is place a tremendous burden on the individual that is there that has an at-large seat and the council member obligatory seat. In fact, I was talking to the only remaining at-large representative the other day and he said: I just do not know how we are going to do it. There are so many issues and challenges facing our industry.

We have a $273 million industry in the State of Maine. The State of New Hampshire has $13 million. So you can imagine the enormity of the problems that are facing our industry at a time when we have a crisis in the groundfish industry, as Senator Kerry will tell you. Yet now we are facing it with reduced representation.

Yes, sometimes our interests will coincide, but other times they will not, as in the issues concerning the groundfish industry. So we have lost our representation and that represents a significant hardship to people who do not deserve to face this problem on top of everything else.

We did not even have a chance to discuss this with Secretary Daly. We had none. I tried to do it. I tried to call him a number of times, with no response. I wanted to have a discussion as to why it mattered to my industry and the State of Maine. Unfortunately it became an arbitrary decision, rather than sitting down and talking about it to figure out how we could resolve the situation.

We are not pitting State against State. In New England, are all in this together. But you could see the difference between having a 3500 mile coast line and a $273 million industry versus 11 miles and a $13 million industry.

So here we are, facing this kind of a confrontation when it was unnecessary. Unfortunately, the fishing communities in my state get to suffer from it. I am hoping the Secretary will reconsider his decision. But since NOAA oversees the council and NMFS, I wanted to be sure that I expressed my strong dissatisfaction, unhappiness and disappointment that this kind of arbitrary decision was made.

Ms. YOZELL. Senator, let me assure you we do not take this issue lightly at all, and I will make sure that Secretary Daly understands where you stand on this issue.

Senator SNOWE. I appreciate it.

Again, I want to thank you, Ms. Yozell, for your testimony and for your colleagues participation here today. Thank you very much for being here.

Ms. YOZELL. Thank you.

Senator SNOWE. We will continue to work on these two issues. Thank you.

Ms. YOZELL. I look forward to working with the Committee.

Senator SNOWE. Thank you.

Ms. YOZELL. Thank you.

Senator SNOWE. We will now proceed to our second panel of distinguished witnesses. I am pleased to welcome Ms. Renee Cooper, the Executive Director of the Caribbean Marine Research Center. The next witness will be Dr. Cynthia Hunter, Curator of the Waikiki Aquarium. We will also hear from Dr. Phillip Dustan, who currently serves as the Science Advisor to The Cousteau Society, and Mr. Michael Collins, a fishing guide from Florida who has served on several sanctuary advisory committees in the Florida Keys National Marine Sanctuary. Also on our panel will be Dr. Michael Connor, Vice President for Programs and Exhibits at the New England Aquarium.

I would like to welcome all of our guests, and I thank you for taking the time for being here on these important issues. I would

ask you to summarize your comments to 5 minutes, and we will place your full written testimony in the hearing record.

Ms. Cooper, we will begin with you. Welcome.

STATEMENT OF C. RENEE COOPER, EXECUTIVE DIRECTOR, CARIBBEAN MARINE RESEARCH CENTER

Ms. COOPER. Madam Chairwoman, thank you for the opportunity to testify on behalf of coral reef conservation. I imagine that few people outside of this room understand the urgency of the need for this legislation. I commend you, Madam Chairwoman and committee members, for taking action to provide for the revitalization of an invaluable resource, our Nation's coral reefs.

The Perry Institute for Marine Science, which operates the Caribbean Marine Research Center, CMRC, and one of the six regional centers of the National Undersea Research Program, has conducted all facets of coral reef research for 30 years. CMRC operates the largest field station and marine laboratory in the southeastern U.S., the Gulf Coast, and Caribbean region, and is one of the premier sites for coral reef research in the world.

Our work includes applying biotechnology to rebuild injured coral reefs, assessing coral reef health, and evaluating the impacts of disease, pollution, coral bleaching, and global warming on coral reefs.

CMRC strongly endorses the efforts being made by this committee's leadership to establish a coral reef conservation program. The importance of such legislation cannot be overstated. We need this legislation because coral reefs and the marine resources that depend on them are severely threatened throughout the world. Human activities that cause stress, deterioration, and death to coral reef ecosystems have increased significantly over the past several decades.

Approximately 60 percent of the world's coral reefs are currently threatened by human activities, including intense coastal development, overfishing, and pollution. Ten percent of the world's reefs are severely damaged or destroyed. Many coral reefs can recover to a healthy state if stresses are removed or reduced through conservation actions like the ones made possible through the pending legislation.

Coral reefs are estimated to be worth $375 billion annually by providing fish, medicines, tourism revenues, and coastal protection for more than 100 countries. Coral reefs and coastal areas account for 38 percent of the goods and services provided by the Earth's ecosystems. This equates to over $12.5 trillion per year, slightly more than from terrestrial systems.

Over 30 drugs from the oceans, many of which come from coral reef environments, are under development. Biotechnology discoveries in reef environments also have application in reef restoration. CMRC is sponsoring research that will provide a simple and universal solution to the world's declining reef communities by inducing coral reef rejuvenation and restoration. This revolutionary solution focuses on the development of a coral fly paper, a chemically treated surface designed to induce coral larvae to settle from the plankton and metamorphose into baby corals.

CMRC believes enactment of a coral conservation bill would be a significant step forward in the rejuvenation of the country's coral

reefs. Current efforts are focused on assessment, monitoring, and enforcement in coral reef areas. We could continue to monitor the decline of our coral reefs for years to come and we can take preemptive action. The provisions of this bill directly support the next vital step of verifying, demonstrating, and implementing coral reef conservation and restoration technologies.

My sincere hope is that this committee will move forward to enact a coral reef conservation program which will propel this Nation into an international leadership position on coral reef conservation and management. CMRC is prepared to work with and to support this committee's initiative in every possible way.

Coral reefs in the U.S. and throughout the world provide enormous benefits to our society and merit the full attention of this Congress and of this country.

[The prepared statement of Ms. Cooper follows:]

PREPARED STATEMENT OF C. RENEE COOPER, EXECUTIVE DIRECTOR, CARIBBEAN MARINE RESEARCH CENTER

Madam Chairwoman, as President of the Caribbean Marine Research Center I am pleased to appear before you today on behalf of the Perry Institute of Marine Science and the Caribbean Marine Research Center to strongly endorse this Subcommittee's commitment to coral reef conservation.

The Caribbean Marine Research Center ("CMRC"), one of the six regional centers participating in the National Undersea Research Program, has a thirty year history of accomplishment in coral reef research and conservation. CMRC operates the largest field station and marine laboratory in the southeast United States, Gulf Coast and Caribbean region. Its research facilities are one of the premier sites for coral reef research in the world.

Researchers from approximately 120 U.S. universities and research institutions have conducted research projects at CMRC's research facilities. More than 150 scientists have come to CMRC's research facilities to undertake coral reef research. Based on their research at CMRC's facilities, these scientists have published 155 scientific papers on coral reef conservation and restoration.

Recent coral reef projects conducted at CMRC's research facilities or sponsored by CMRC include research on (1) how to rebuild injured coral reefs by applying biotechnology to reseed damaged reefs; (2) methodologies to assess the health of coral reefs and other reef organisms; (3) the effect of oceanographic conditions on nutrient transport and the health of coral reefs; (4) the optimal light and temperature conditions needed for coral reef growth; (5) the impact of global warming on coral reefs, including the impact of ultraviolet radiation on tropical reefs; (6) the impact of various pollutants on coral reefs; (7) the effects of increased water turbidity on coral reef survival; (8) the range of natural variation in coral reef health and ecosystem structure; (9) methodologies for identifying and monitoring the incidence of coral disease; (10) larval production and metamorphosis in coral reefs; (11) the physiology of coral reefs; (12) the impact of hurricanes on reefs; (13) the community structure of reef corals; and (14) the phenomena of coral bleaching and recovery.

The previous Director of the National Undersea Research Program characterized CMRC's coral reef program as providing "an invaluable service not only to the scientific community, but also to U.S. resource managers" because the research conducted at CMRC's facilities "is absolutely required to help in the preservation and restoration of the U.S. [Exclusive Economic Zone] coral reefs....Without the responsive nature of CMRC's coral reef studies, it would be difficult to determine how to proceed to save severely damaged corals."

Although CRMC also conducts extensive research relating to global warming, fish ecology and fisheries conservation, aquaculture, deep sea dynamics, alternative energy sources, physical oceanography, and biotechnology, it is our expertise and experience in coral reef conservation and restoration which brings us before you today.

CRMC strongly endorses the efforts being made by this Committee's leadership to establish a coral reef conservation program. The importance of such legislation cannot be understated. Existing coral reef programs focus primarily on reef assessment and monitoring techniques. It is important to take the next step which is to develop, verify, and implement coral reef conservation methods and restoration technologies.

More than 60% of the world's coral reefs are threatened by human activities including intense coastal development, overfishing and pollution. Coral reefs fulfill many vital needs of the United States including:

- providing major commercial and sport fisheries with habitats essential to their survival during one or more life stages,
- supplying the prey that the major species of fish feed upon since reefs are the primary habitat of many of the prey species,
- protecting our coastal communities from major storm damage,
- attracting tourists and supporting the coastal tourist economy in the tropics and subtropics, and
- providing vitally important biotechnology and genetic material for use in medicines and cancer-arresting drugs and for use as surgical implants in bone reconstruction.

Coral reefs are estimated to be worth $375 billion annually by providing fish, medicines, tourism revenues, and coastal protection for more than 100 countries. As the most productive areas in the ocean, coastal environments that include coral reefs as a major component account for 38% of the goods and services provided by the earth's ecosystems. This magnitude of productivity equates to over $12.5 trillion per year, slightly more than that from terrestrial systems.

Coral reefs support major ocean fisheries such as spiny lobster, grouper, snapper, jack, ballyhoo, mackerel and dolphin fish. Coral reefs provide the engine to support the world's fisheries because coral reef environments provide vital links in the food chain and the critical habitat that major commercial and sport fish species depend on for survival during one or more parts of their life cycle. And the importance of protecting our fisheries cannot be underestimated. Worldwide, people obtain approximately 16% of their animal protein from fish—and the demand for seafood is expected to increase by 70% in the next 35 years. Over 200 million people worldwide depend on fishing for some portion of their income. A significant portion of the multi-billion dollar value of international fisheries comes from fisheries associated with and supported by coral reefs.

An invaluable wealth of medicines and genetic material are waiting to be discovered in the life forms that inhabit coral reef environments. For example, as recently as 1997, scientists discovered that a fish inhabiting reef environments produces a compound that arrests cancer by stopping the blood flow to tumors.[1] CMRC has supported vital biotechnology research on the newly discovered active compound in a Caribbean soft coral used in skin treatments. This discovery, along with the development of sustainable harvest techniques, culture techniques, basic biology and essential habitat information is expected to lead to a new and economically important biotechnology industry which holds the promise of new treatments and cures.

Over 30 drugs from the oceans, many of which are from coral reef environments, are under investigation by drug companies. Compounds have been developed which can be used to sooth swelling caused by sunburn or chemical irritants by blocking a key enzyme involved in inflammation. Psoriasis, sunburn and arthritis all involve inflammation that one day may be treated by an agent found in the soft coral. The same extract could potentially have many medicinal uses. For example, the extract might be added to toothpaste for soothing inflamed gums, or to skin creams to limit sun damage.

The results of biotechnology discoveries in reef environments also have application in reef restoration. For example, CMRC is sponsoring research that unlocks the mystery of coral colonization. The new technology will provide a vital solution to the world's declining reef communities by inducing coral reef rejuvenation and restoration.

This new research, sponsored by CMRC, the National Undersea Research Program, and the National Science Foundation, offers the prospect of responding to the distressing trends in coral decline with a practical, universal solution. This revolutionary solution focuses on the development of a "coral flypaper"—a chemically treated surface designed to induce coral larvae to settle from the plankton and metamorphose into baby corals. The larvae of corals must first detect a chemical signal in their ocean environment before they can settle from the plankton, attach to a hard surface and develop into mature corals. The newly discovered signal molecule required by coral larvae is attached to materials such as glass or tile. The result

[1] Other examples of anti-cancer drug discoveries from ocean resources include the following: a chemical in an Indian Ocean mollusk shows promise as a skin cancer cure; a Caribbean sea whip produces a compound that has been effective against leukemias and human breast cancer; agents found in Australian yellow soft coral and a Mediterranean coral stop malignant tumors from growing; and a New Zealand yellow sponge produces a promising anticancer chemical.

is "coral flypaper" to cue coral larvae to settle from the water, attach to its surface and develop into thriving corals.

It is a distressing fact that we need such restoration programs because coral reefs and the marine resources that depend on them are severely threatened throughout the world. Direct and indirect human activities that cause stress, deterioration and death to coral reef ecosystems have increased significantly over the last several decades. Approximately 60% of the world's coral reefs are currently threatened and 10% of the world's reefs are severely damaged or destroyed. Although many coral reefs can recover to a healthy state if stresses are removed or reduced through conservation efforts, the facts are that restoration programs are essential.

The conditions that make coastal areas the prime site of coral reef growth—shallow water and their place at the crossroads between land and seas—unfortunately also make them vulnerable to human assault. Currently more than 2 billion people live in coastal areas and many more millions crowd the world's beaches and coastal areas each year. Human activities increasingly cause much of the decline in coral reefs. Coral reefs in the southeastern United States and the wider Caribbean region, indeed, reefs throughout the world, are currently under siege by various threats.

The most accessible coastal environments are becoming heavily impacted due to the sheer numbers of visitors. Damage is done to fragile reef areas by careless snorkelers and divers, anchor impacts, accidental boat groundings and propeller damage. But, coastal deforestation, coastal development, and beach renourishment projects are also significant forces impacting coral reefs. Such activities often cause sediment runoff which clouds nearshore waters and smothers corals that need sunlight to survive. Contaminants such as fertilizers, human wastes, toxic chemicals and sediment also come from land-based pathways, flowing down rivers into tidal estuaries where these contaminants bleed into the reef environments. Some of these contaminants promote algal blooms that rob the oxygen content of coastal waters, choking the life out of fish, corals and countless other marine creatures. Large portions of the Gulf of Mexico are now considered ecological "dead zones" due to algal blooms.

The introduction of exotic species, those species transplanted from their place of origin by human actions, represents another threat to the world's coral reefs. Globally, thousands of exotic species are estimated to be in the ballast tanks of ships that cruise from one country to another. The waters of the United States are thought to receive at least 56 million tons of discarded ballast water a year. Heavily stressed marine environments are more susceptible to rapidly colonizing species. For example, the Black Sea was vulnerable in the 1980's to an exotic species introduction due to a combination of overfishing, coastal habitat degradation, and increasing agricultural and industrial pollution. With no natural enemies and a diet of fish eggs, larvae and other plankton, the Atlantic comb jelly—probably released from a ship's ballast—helped wipe out 85% of the marine species in the Black Sea. Today, the coral reef environments of the Florida Keys, Gulf of Mexico and wider Caribbean are equally vulnerable to exotic species due to heavy ship traffic in the region.

Changes in temperature, climate and atmospheric conditions pose high risks to marine species living in and comprising coral reef environments. CMRC has been monitoring these changes and their effects on coral and other reef organisms for two decades. Data have shown increases in ultraviolet radiation caused by a decrease in the protective ozone layer of the atmosphere. Studies on the resulting effects shows that the increase in radiation has a negative effect on photosynthesis and, therefore, on the base of the food chain in the oceans and on primary food production in reef environments. Research has also shown that the increased radiation damages larval development in corals, shrimp, crabs, and some fish. These effects could devastate coral reefs and some fisheries. Other potential devastation resulting from climate change includes increasing ocean temperatures that scientific research has linked to the severity in coral bleaching. Researchers at CMRC have studied natural variation in coral pigmentation and the factors contributing to coral bleaching since the mid-1980's when wide-spread coral death resulted from a major bleaching event. Further study is needed to identify coral reef areas with the highest risk of bleaching induced death and to discovery ways of mitigating those threats. Passage of the pending legislation will help make that important work possible.

We appreciate that you share our concern about the preservation of healthy coral reef environments and about the urgent need to develop conservation and restoration methods for coral reefs. We have a chance to protect our important coral reef resources through sound scientific methods and the development of viable management approaches.

CMRC believes enactment of S. 725 would be a significant step forward in the conservation and restoration of coral reefs. We would, however, suggest a few minor

amendments to S. 725. The text of these amendments is enclosed as Attachment A to my testimony. CMRC believes these amendments would strengthen S. 725 which provides for a vitally important next step in the fight to save the viability of our coral reefs. Current funding and agency support is focused on assessment, monitoring and enforcement in coral reef areas. The provisions of S. 725 directly support the verification, demonstration and implementation of coral reef conservation and restoration technologies. This legislation provides marine resource managers responding to our nation's urgent plea for action with real solutions and the funding with which to implement them.

I would also like to apologize to Senator Inouye because we did not have the time before this testimony was required to be submitted to carefully examine S. 1253, principally because I was serving on jury duty last week. However, we would be pleased to offer suggested amendments to that bill if that would be helpful to you.

Madam Chairwoman, I commend you and Senator McCain for your leadership in establishing a national coral reef conservation program. I also commend Senator Inouye and several Members on the other side of the aisle who are equally interested in this issue and are fully committed to establishing a national coral reef conservation program. My sincere hope is that this Committee will move forward to enact a coral reef conservation program which will propel this nation into an international leadership position on coral reef conservation and management. We also recognize that in this era of budgetary limitations there is substantial difficulty in starting new programs and that our expectations and goals must be realistic. Nevertheless, CMRC is prepared to work with, and to support, this Committee's initiative in every way possible. Coral reefs in the United States and throughout the world provide enormous benefits to our society and merit the full attention of this Congress and of this country.

Attachment A

PROPOSED AMENDMENTS TO S. 725

1. Page 1, after line 11, insert the following and renumber subsequent paragraphs accordingly:

"(3) To verify and demonstrate coral reef conservation and restoration technologies and methodologies;

"(4) To assist in the conservation, protection and restoration of coral reefs by developing standard conservation and restoration criteria and guidelines;".

2. Page 4, line 14, after the period insert the following:

"Such projects shall be consistent with standardized conservation and restoration criteria and guidelines developed by the Secretary or developed pursuant to projects approved under this Act.".

3. Page 3, line 19 after the second semi-colon, insert the following:

"the development of standardized conservation and restoration criteria and guidelines for coral reef resource managers; verifying and optimizing coral reef protection and restoration methodologies and technologies; the development of sound scientific methods for determining the condition of coral reef ecosystems and for identifying and categorizing the threats to such ecosystems;".

4. Page 9, amend lines 9-11 to read as follows and renumber subsequent paragraphs accordingly:

"(4) verifying and optimizing conservation and restoration methodologies, technologies and procedures through research and demonstration;

"(5) developing standardized conservation and restoration criteria for coral reef resource managers;

"(6) developing sound scientific methods for determining the condition of coral reef ecosystems, identifying and categorizing the threats to such ecosystems and selecting optimum mitigation and restoration actions based on the specific circumstances of such ecosystems;

"(7) developing decisionmaking processes and guidelines for coral reef resource managers;".

PERRY INSTITUTE FOR MARINE SCIENCE CARIBBEAN MARINE RESEARCH CENTER

AFFILIATED ORGANIZATIONS

1. Auburn University
2. Austin Community College. Austin, TX
3. Bahamas National Trust, Exuma Land & Sea Park (Bahamas)

4. Baylor University
5. Boston University
6. Bowling Green State University
7. Brevard Mosquito Control, Brevard County, Florida
8. Bronx Center for Social Services.
9. Brookhaven National Lab—Upton, NY
10. California State University, Monterey Bay
11. California State University, Northridge
12. Carleton University, Canada
13. Center for Marine Conservation
14. Coastal Systems Station, Panama City, FL
15. College of Charleston
16. College of the Atlantic
17. Collage of the Bahamas (Bahamas)
18. Colorado School of Mines
19. Columbia University—Palisades, NY
20. Coral Reef Research Foundation
21. Cornell University
22. CPACC—Organization of American States (OAS)
23. Dalhousie University (Canada)
24. Dartmouth College, Hanover NH
25. Dauphin Island Sea Lab
26. Department of Environmental Protection, Florida
27. Department of Meteorology—Bahamas
28. Dill Geo-Marine
29. Divers Alert Network (DAN)
30. Division Fish and Wildlife, U.S. Virgin Islands
31. Dreyfoos School of the Arts, Palm Beach Co. Public Schools
32. Duke University, Beaufort, NC
33. Earthwatch
34. Eckerd College
35. Exuma High School (Bahamas)
36. FTU—Mote Marine Lab
37. Flamingo Bay Research, Cairns, Australia
38. Florida Atlantic University
39. Florida Environmental Research Institute—The Florida Aquarium, Tampa, Florida
40. Florida Game & Fish Commission
41. Florida Institute of Oceanography
42. Florida Institute of Technology
43. Florida Keys Marine Laboratory
44. Florida Marine Research Institute
45. Geologisches Institute (Switzerland)
46. Geologish-Palaeontologishes Institut, J.W.Goethe Universitat (Germany)
47. Georgia Southern University Statesboro, GA
48. Gumbo Limbo Environmental Complex—Boca Raton, FL
49. Harbor Branch Oceanographics Institute
50. Haskins Shellfish Research Laboratory
51. Humboldt State University
52. Institute of Zoology, Germany
53. Instituto Technologico y Estudios Superiores do Monterrey (Mexico)
54. James Cook University
55. Kings College—London (England)
56. Laurentian University (Canada)
57. Looe Key National Marine Sanctuary
58. Maine Maritime Academy
59. Manhattan College
60. Massachusetts Institute of Technology
61. Max Planck Institute for Marine Microbiology, Brenen, Germany
62. Miami University
63. Michigan State University
64. Monell Chemical Senses Center
65. Moss Landing Marine Labs—Hopkins Marine Station
66. Mote Marina Laboratory (Florida)
67. Natural History Unit, BBC, Briston, UK
68. Naval Research Lab
69. NMFS—Miami
70. NOAA Flower Gardens National Marine Sanctuary

71. NOAA/AMPL/OCD
72. NOAA/Coastal Ocean Office Processes
73. NOAA/OAC-PDL
74. NOAA/Oceanic and Atmospheric Research
75. North Carolina State University
76. North Dakota Geological Survey
77. Northeast Fisheries Science Center NOAA/NMFS
78. Nova University
79. Oasis Program—University of South Florida
80. Oberlin College, Oberlin, OH
81. Office of Naval Research—Bigelow Lab
82. Office of Naval Research, DOD
83. Old Dominion University
84. Oregon State University
85. Pew Charitable Trusts
86. Principia College
87. Rosenstiel School of Marine & Atmospheric Science (Florida)
88. Rutgers University
89. Salem State College
90. Science Applied International
91. Scripps Institute of Oceanography
92. Shearwater Foundation
93. Smith College
94. Smithsonian Institute
95. Smithsonian Tropical Research Institute
96. Southern Cross University (Australia)
97. Southern Methodist University
98. State University of New York—Buffalo
99. State University of New York—Stony Brook
100. Station Marine d'Endoume, Centre d'Oceanologie (France)
101. Stoakes Consulting Group Ltd. (Canada)
102. Swedish Museum of Natural History-Stockholm, Sweden
103. Tetra Tech, Inc.
104. Texas A & M University, College Station
105. Texas A & M University, Galveston
106. Tulane University
107. United States Geological Survey
108. Universita degli Studi dela Calabria (Italy)
109. Universitat Innsbruck, Innsbruck, Austria
110. Universite de Bourgogne, Dijon, France
111. University of Arkansas
112. University of California—Davis
113. University of California—Los Angeles
114. University of California—San Diego
115. University of California - Santa Barbara
116. University of California. - Santa Cruz
117. University of Cincinnati, Cincinnati, OH
118. University of Connecticut
119. University of Copenhagen, Copenhagen. Denmark
120. University of Delaware
121. University Edinburgh, Edinburgh, Scotland
122. University of Florida—Archie Carr Center for Sea Turtle Research, Gainesville, FL
123. University of Frankfort—Germany
124. University of Georgia
125. University of Graz, Graz, Austria
126. University of Guam Marine Laboratory
127. University of Guam, Mangilao, Guam
128. University of Hamburg, Hamburg, Germany
129. University of Hawaii - Honolulu, HI
130. University of Houston, Houston, TX
131. University of Leicester, Leicester, UK.
132. University of Maine, Walpole, ME
133. University of Maryland-College Park
134. University of Maryland—Eastern Shore
135. University of Maryland—Princess Anne
136. University of Miami
137. University of Mississippi

138. University of New Hampshire
139. University of New Orleans
140. University of North Carolina
141. University of Noith Carolina—Wilmington
142. University of Puerto Rico
143. University of Queensland (Australia)
144. University of Richmond
145. University of Rochester
144. University of South Carolina
147. University at South Florida
148. University of Sydney—Sydney, Australia
149. University of Technology—Sydney, Australia
150. University of Texas—Austin
151. University of Texas—Dallas
152. University of Texas—Houston
153. University of Vigo, Spain
154. University of Virginia
155. University of Washington
156. University of West Florida
157. Utah State University
158. Virginia Institute of Marine Science
159. Warren Wilson College, Asheville, NC
160. Western Washington University
161. Western Washington University-Shannon Point Marine Center
162. Wilmington College, Wilmington, OH
163. Woods Hole Oceanographic Institution
164. Wright State University
165. Yale University

Senator SNOWE. Thank you very much, Ms. Cooper.

Dr. Dustan.

STATEMENT OF PHILLIP DUSTAN, PH.D, SCIENCE ADVISOR, THE COUSTEAU SOCIETY

Dr. DUSTAN. Thank you. Madam Chairman, Chairperson, good afternoon. My name is Phillip Dustan. I am testifying on behalf of the Cousteau Society. I am a professor at the College of Charleston in South Carolina. I am a principal investigator on the USEPA coral reef monitoring project in the Florida Keys and also principal investigator on the Sustainable Seas Project. I would like to share with you some of the results of my work over the last 25 years in the Florida Keys, and I have brought a carousel of slides to do that. So if we can lower the lights, I would be happy to turn on the machine.

[Slide.]

As we have heard today, we know that coral reefs are the largest construction projects on the face of the planet. If you were approaching from space, the first sign of life you would have on this planet would actually be coral reefs, as you see here in the Maldives.

[Slide.]

I do not want to dwell on these areas too much.

[Slide.]

[Slide.]

Corals in many respects are very, very thin amounts of tissue on top of a rock that they build. So when we are talking about coral, we are talking about maybe a tenth of a millimeter of living flesh on top of this skeleton.

[Slide.]

Most of the time you see them as you see here, as mostly these animals that are expanded with their mouths. They are very active predators, and their yellow-brown color is due to the algae or symbiotic zozanthellae that live in their tissues. That is the real key to their ecological success.

What I would like to talk to you about today is my work in the Florida Keys, down here at the bottom of Florida. Especially in this photograph taken from the Space Shuttle, the hydroscape of the Florida area starts at Lake Okeechobee and this water moves south through the Everglades and through this area and ultimately down through the Florida Keys, as well as water moving along the coasts.

[Slide.]

This area has undergone explosive growth in the last few years, and people enjoy certain aspects of living in these areas. Thousands of people go diving every year. Thousands of people build houses, and I would like to dwell on this just for a moment because this is an old mangrove area that was dredged out and the dredge spoil was put here to build houses on. So the original soil was disturbed, which opens the area up for erosion.

Then every single one of these houses has what you might call a cesspit. It basically has a pipe that goes down into the porous rock. There is no sewage infrastructure in most of the Florida Keys. In a matter of hours, if you flush the toilet in one of these you will see signs of that out here in the canal.

[Slide.]

People like to—they enjoy boating. Small vessels or ships sometimes go boating on the reefs.

[Slide.]

This is what it looks like underwater, where we see the wreckage of the boat and a lot of broken coral. This particular grounded boat, in 1974, is a 36-foot trimaran. It absolutely destroyed an area 10 meters wide and 60 meters long of one of the most pristine reefs in the Florida Keys at that time, Key Largo Dry Rocks.

By the way, that reef still looks that way today, except that it is just overgrown with algae.

My work began in the Florida Keys at Carysfort Reef, the largest and the most diverse reef in the Florida Keys, in 1974 when I was asked to head up a project funded by the Smithsonian and the Harbor Branch Foundation. We started the Florida Keys Coral Reef Project. We surveyed the reef with line transects and collected actual numerical data on the abundance of corals.

We encountered diseases, such as black band disease, which you had a photograph of. This particular coral (photo) is probably 300 to 500 years old and black band disease is creeping across its surface in terms of millimeters per day.

I had the dubious distinction of discovering the second scourge of corals or coral disease, white plague, so named because it leaves behind just the white bright skeleton of the coral. It is caused by some sort of a microorganism, and we are beginning to identify that now with one of my colleagues, Dr. Lauri Richardson.

White plague is much more virulent than black band disease. It will kill a large coral colony like this (photo) in a matter of sometimes days, but probably mostly months. Recently we have seen a

resurgence of white plague disease, and the divers would come in and ask: What are all those snowballs on the reef? And they were just recently dead corals.

So we have corals that are 200 to 300 years old, the elders of the society, dying in a matter of months.

[Slide.]

We also have bleaching. Bleaching has been relatively well known for about a hundred years. Corals would bleach when they were stressed. The water is too cold, the water is too hot, the water is too saline, the water is not saline enough. Put the corals in the dark, they bleach.

It has only been recently that they have become more stressed and the environment has become more stressful, that sometimes they bleach and die.

[Slide.]

The bottom line to my research in the Florida Keys from 1975 to 1985 can be summarized in three slides, actually two with the third follow-on. This is the shallow reef with elkhorn coral in 1975 on Carysfort Reef in our study site. It approached about 50 to 60 percent cover of the bottom at that point. It is a very healthy reef.

[Slide.]

Ten years later, in 1985, this is the exact same reef. Most of this is rubble now. If you look carefully, there is a vee here that comes out and is probably the scar marks from a relatively small boat, somewhere between 30 and 50 feet, that crashed into the reef. So the shallows have been destroyed, and the corals are not regenerating the way they used to do.

Hurricanes would come through in the fifties and destroy a reef like this and the reef would regrow in a matter of years. That is not happening any more.

[Slide.]

This is the reef in 1995, the same reef. There is virtually no living coral in this area. What you see here, these little black marks, are fish. That is a fish school that has come through to graze. So we have seen a precipitous decline.

Now, in 1995 the EPA started the Florida Keys Coral Reef Monitoring Project and I was asked to be a principal investigator on that.

[Slide.]

We took one site here and two other sites down here where we had been working for a while, and we extended the amount of our sampling all the way up and down the reefs, because we wanted to not just look at one site, but we wanted to increase the spatial scale of our sampling.

[Slide.]

We studied, we examined and censused for diseases, bleaching and various kinds of diseases. We have a new category called "other diseases." There are probably between 5 and 15 new diseases, and new ones being discovered annually. Our initial findings actually spawned a second project called the Coral Reef Disease Study, which is also funded by EPA in the Florida Keys.

[Slide.]

I will share with you a few repetitive sampling transects. In 1997 we see a relatively healthy coral with some areas of dead, but the

brown here is living coral tissue with its symbiotic algae. In October there was a bleaching event and you can see the white area here is bleached coral. Now, at the same time this coral became infected with black band disease, and that is this band.

In May 1998 the coral had recovered its algae, but there were large areas that were dead and a large part of this is due to this disease. So corals that are stressed, as we heard earlier, are more susceptible to disease most probably.

[Slide.]

Here is another series of transects I would like to share with you—1996, 1997, 1998. This is Carysfort Reef and this is about 10 meters of bottom. This is a live coral here in 1996, and there is another one here and there is another one here. This is a dead coral.

This coral in the next picture, 1997, is still alive, but in 1998 it is dead and being encrusted with algae. This coral here, you can see here, has a white area. That is white plague, and it is reef rock here in 1998; it is just turned into rock. This coral is still alive.

These are the kinds of results that we are finding with our EPA project, which is probably the most precise and large-scale monitoring project on the planet for coral reefs at this time.

[Slide.]

This graph summarizes what has happened at Carysfort Reef between 1975 and 1997. In the shallows, with the pictures I showed you we started at somewhere around 40 percent cover, went up a little bit, and then precipitously declined, so we are now at around 10 percent cover or less. In the deeper parts of the reef we have gone from 60 percent to 50 percent and down now we are at around 5 or 6 percent on this same reef.

[Slide.]

This is the first pictures that anyone has ever done to show actually that you can use satellites to map and monitor the change in reefs. In this image what I would like to show you is, this is an aerial photograph of the reef. This is a lighthouse right here and that is the shadow of the lighthouse. This is about a 300 foot long shadow.

This area of this reef, Carysfort, are these sequences that I have shown you. We have taken the outline of this reef and used it to outline thematic mapper satellite imagery, and we have processed this imagery so the color is actually related to the true color of the reef, the browns and the yellows, and then out here you can see the blues of the sands.

The vertical axis on this three dimensional rendering is change over time. It is very clear to see that in the last 16 years that we have this data from we see the most change on the reef occurring where we have seen the greatest ecological change. This I think represents the forefront of using satellite technology to map and monitor coral reefs, and this was done in my laboratory at the College of Charleston.

[Slide.]

Now, Reefs at Risk, which you have heard about was published about a year ago. It suggests that about 58 percent of the coral reefs are threatened on the planet. The ones that are not threatened are the ones more in the central Pacific areas. There are dramatic threats over here. (Caribbean and S.E. Asia).

We also have at the same time these coastal hypoxic dead zones which we have been hearing about. These are outlined on this map in red. What I have done here, is also placed the patterns of the ocean currents in this image. What we see here is, for instance, deforestation in the Amazon will be picked up by the Guyana current and brought into the Caribbean and out past the Florida Keys. We have actually detected sediments from the Guyana Shield from South America on Carysfort Reef.

So everything is connected in the oceans. What I would like to submit is that reefs are indicators of the health of the ocean. Not only are they important to themselves, but they are harbingers of a changing ocean, and harbingers in terms of what we put in in localized places, what we put in from dustfall from here has created a series of nested stresses.

[Slide.]

I think I have painted a pretty grim picture of what is going on, and I really would rather not have done that, but this is the truth. This is what I have seen with my own eyes.

I really like the bill that you have proposed, S. 725, because it puts the money in the hands of little people. Most of the work you have seen here, with the exception of EPA, and even that is grossly underfunded, but most of this was done with 5 and $10,000 grants or by myself and my students because we just wanted to do it.

Much of the innovative science today is done on that level, by people that are innovative and really just constructive and creative scientists doing this sort of work. That goes for the conservation industry as well, all the NGO's and everybody else.

So in summary, I would like to say that Captain Cousteau actually taught us that the oceans are alive and he shared his love of the sea with us. He always felt that people would protect things they love, and we all love coral reefs and we all love the ocean and we all love people. So I think it is time we get together and try to make it happen.

Thank you very much, and the Cousteau Society is more than willing to work with you.

[The prepared statement of Dr. Dustan follows:]

PREPARED STATEMENT OF PHILLIP DUSTAN, PH.D., SCIENCE ADVISOR, THE COUSTEAU SOCIETY

INTRODUCTION

Good afternoon. My name is Phil Dustan, and I am testifying on behalf of the Cousteau Society for which I serve as Science Advisor. As the new millennium approaches, it is appropriate to take stock of the health and assess the future prospects of the most fantastic undersea ecosystems ever explored by Captain Cousteau—the world's coral reefs.

The Cousteau Society is a nonprofit, membership-supported organization dedicated to the protection and improvement of the quality of life for present and future generations. Created in 1973 by Captain Jacques-Yves Cousteau, the Society has approximately 150,000 members worldwide. Cousteau teams have explored the water system throughout the world for over forty years. Their unique explorations and observations have been documented in more than forty books, four feature films, and over one hundred television documentary films that help millions of people to better understand and appreciate the fragility of life on our Water Planet.

I am a Professor of Biology at the University of Charleston, SC. I am a coral reef ecologist specializing in the ecology, photophysiology, and vitality of corals and coral reef communities. Much of my work centers on detecting changes in the coral reefs of the Florida Keys. I have worked in the Florida Keys, Bahamas and throughout

the Caribbean Sea, Sinai Peninsula in the Red Sea, and the Seychelles Islands, Indian Ocean. My field experience includes over 1000 scientific dives, submersible experiences, and thousands of miles at sea on scientific research cruises to most of the oceans of the world. As a young scientist, I first worked with Captain Cousteau in 1974-5 filming, writing, and editing the Mysteries of the Hidden Reefs, part of the Undersea World of Jacques Cousteau series. I also have worked on the synthetic coral reef project in the ecologically closed Biosphere2 experiment in Arizona and participated in developing the use of NASA satellites to map oceanic productivity. Finally, I am presently a principal investigator on the U.S. Environmental Protection Agency Florida Keys Coral Reef/Hardbottom Monitoring Project.

Madame Chair, Members of the Committee, thank you for providing me with this opportunity to appear today as witness before the Subcommittee on Oceans and Fisheries.

ANCIENT ECOSYSTEMS FACING MODERN PROBLEMS

Captain Jacques Cousteau opened the eyes of millions of people around the world to the wonders of the undersea realm. He showed us that the oceans are alive. His vision and spirit of adventure took us to places never before experienced. The voyages of Calypso fed our imagination and sparked our desire to understand the nature of life beneath the sea. Some of his earliest films focused on coral reefs, the most marvelous of all underwater ecosystems.

Coral reefs are found throughout the tropical, equatorial waters of the world's oceans. They are the oldest, most complex ecosystems in the sea—the marine equivalent of tropical rain forests in terms of ecosystem diversity and productivity. Coral reefs are a reservoir for much of the world's marine biodiversity, supply an estimated 10% of the world's fisheries, protect small island developing states from coastal erosion, and provide a strong economic base for tourism. Additionally, we are just beginning to understand the incredible potential this rich biodiversity may hold for scientific and medical advances.

Modern coral reefs evolved approximately 225 million years ago, and over this enormous span of time they have developed sophisticated ecological relationships that support such rich marine biodiversity. Reefs are built by tiny colonial organisms who compound their skeletal masses over thousands of years. Crystalline calcium carbonate is deposited by single celled animal-plants with paper thin tissues who make skeletons that withstand the strongest seas. Coral reefs are without doubt the strongest biologically built structures on the planet, and are the only naturally built ecosystems in the seas that are visible from space. Coral reefs are nature's biggest construction project.

Unfortunately, their delicate complexity makes coral reefs vulnerable to changing environmental conditions, particularly temperature, sediment, and nutrient concentrations. Ironically, the many values of coral reefs—as a fisheries resource, for coastal protection and building materials, and more recently as tourist attractions—now are contributing to their steady and rapid decline. Sadly, scientists and resource managers recognize that catastrophic coral reef degradation is occurring in all oceans of the world at unprecedented and alarming rates.

Anthropogenic stresses are thought to be contributing to the deterioration of coral reef ecosystems throughout the world, but most notably in the Caribbean and the western Atlantic. Growing coastal populations and related development have altered the ecological characteristics of watersheds, resulting in rivers overloaded with sediments, nutrients, and toxic chemicals. Coral reefs subjected to these conditions are showing signs of decreasing health—coral cover is disappearing while lethal algal growth is expanding. Overfishing and the commercial harvest of reef resources have contributed to unprecedented decline in reef diversity and ecological stability. Ironically, many reefs also are suffering from increased "eco- tourists" who cause direct, physical damage to the reefs they visit by taking home "just one souvenir." Finally, coral bleaching is widespread in every tropical sea, which scientists have linked the gradual warming of the ocean.

In addition to their intrinsic biological and esthetic values, coral reefs are important to many regions of the United States as a source of economic development, principally through tourism, but also as a foundation for many important recreational and commercial fisheries. Coral reefs also play a fundamental role in the economic structure of tropical coastal countries throughout the world, both as sources for local commercial fisheries and attractions for foreign visitors. Ultimately, coral reefs may be a vital indicator of overall oceanic health and global climate developments and may assist in our understanding of the complex relationships in our global ecosystems.

LONG TERM SCIENTIFIC STUDY ON THE HEALTH OF

THE FLORIDA KEYS CORAL REEFS

My research into coral reefs began with my graduate studies in Jamaica in 1969. In 1974, I began to investigate man's impact on coral reefs in the Florida Keys, a project funded by the Smithsonian Institution and the Harbor Branch Foundation. My direction was to investigate human impacts on coral reefs. This began the longest, continuously running study of the health and vitality of corals reefs in the Florida Keys, and in the world. My approach to the problem was hierarchical, with studies at the levels of individual corals, localized populations, and the broader ecosystem. We established a permanently marked transect study site at Carysfort Reef, the richest and most diverse reef in the Florida Keys. My research team surveyed abundance of corals, estimated their recruitment and mortality rates, and began to assess anthropogenic impacts. Today these data serve as a baseline for evaluating the degradation of a once healthy coral reef ecosystem.

My team's initial work suggested that the reef tract was changing quickly. Coral recruitment was much lower than in the West Indies, and small corals were becoming more difficult to find. Two coral diseases, Black Band Disease and White Plague were just becoming significant infectious diseases, and a third condition, algal-sediment encroachment, comprised the major agents of mortality. In the summer of 1975, we established a study site in the Dry Tortugas, ostensibly as a control site for the Florida Keys. The reefs there were in much better condition that the northern Florida Keys, as coral development there was very rich, with little or no disease.

Returning in 1982 to resurvey Carysfort Reef, I observed that in seven years coral cover and diversity had increased in the shallow areas of the reef while the deeper, fore-reef terrace had suffered significant losses (Dustan and Halas, 1987). Change in shallow water seemed driven by the destruction of the dominant stands of Acropora palrnata, elkhorn coral. The area bore the scars of boat groundings, including pieces of propeller blades and signs of antifouling bottom paint. Cover had increased because the lush, three-dimensional habitat had been reduced to planar rubble which covered more of the bottom and smaller colonizing species were settling on open substrate. However, deeper colonies were dying from disease and sediment damage, and they no longer were being replaced by recruitment. High rates of mortality continued to be documented by other researchers in the Florida Keys between 1984 and 1991 (Porter and Meier, 1992).

In July 1984, my students and I made observations on the phenotypic condition of over 9800 corals on 19 different reefs in the Key Largo region. Sixty percent of the corals showed signs of physical or biological stress, 5-10 percent were infected with disease and about one third appeared healthy. Surprisingly, virtually all the areas we surveyed had approximately the same level of unhealthy corals.

As a control to our observations, we visited the reefs of San Salvador, Bahamas, site of Columbus' first landing in the Western Hemisphere. I was surprised to find that similar patterns of reduced coral vitality. A higher percentage of corals were considered healthy, but we also found a host of diseases, including Black Band and White Plague. Therefore, it was disturbing to observe such high percentages of "stressed" corals could be found even in waters that are remote from industrial pollution or anthropogenic nutrient loading (Dustan, 1993).

EARLY FEDERAL RESPONSE TO THREATS

FACING FLORIDA KEYS CORAL REEFS

As a result of increased scientific recognition that Florida Keys coral reefs were deteriorating, Congress passed legislation to provide protection to coral reefs and support research on the declining health of coral reef ecosystems. In 1990, the Florida Keys National Marine Sanctuary Act established the Florida Keys National Marine Sanctuary and directed the U.S. Environmental Protection Agency ("U.S. EPA") to institute a water quality assurance and protection plan for the Florida Keys, and to monitor the status and trends of the seagrasses, coral reefs and hardbottom communities and water quality.

My colleagues and I designed the U.S. EPA Coral Reef Monitoring Project ("CRMP"), to detect change in the status and trends of coral reef and hardbottom communities of the Florida Keys. We used repetitive underwater observations and video transects to provide estimates of biodiversity, distribution, and coverage of reef corals and associated benthie organisms. Starting - in 1996, the CRMP annually sampled 160 stations at 40 sites on 32 reefs that are distributed throughout the Florida Keys. In June 1999 we added ten more stations at threes site in the Dry Tortugas.

When we began this project I felt that we might see some changes within the first five years. However, the rate of degradation has been much faster. In three years of sampling we have witnessed increases in the distribution of diseases which kill corals, increases in the number of species with diseases, and coral bleaching has become relatively common. Many of the reefs have lost species.

PRECIPITOUSLY DECLINING HEALTH AT CARYSFORT REEF

Carysfort Reef has continued to decline. By June 1998, coral cover in the shallows had decreased to approximately 10%, and 5 to 10% in the deeper habitat zones. During a dive on Carysfort Reef in July 1998, we were unable to find a single colony of star coral, Montastrea annularis species complex, that was not infected with the White Plague. Large colonies (in excess of 1 meter in diameter) were rapidly being overtaken by White Plague. Since the skeletal growth rate of M. annularis has been measured at 5 to 10 ram/year, I estimated that these colonies are at least 100 years old (Dustan, 1975). Some colonies are at least twice this age, and White Plague kills them in less than a single year. With such rapid mortality of large colonies, coral cover may soon fall below 5% cover, and corals will cease providing any significant contribution to reef framework construction.

It is not an overstatement to suggest that this reef is entering a state of ecological collapse. Similar ecological degradation has occurred on many reefs throughout the Florida Keys, including Molasses Reef, Looe Key, and Sand Key. Carysfort, however, is the only reef where this longterm change has been documented with quantitative line transect studies. In fact, the change is so extensive that it can be detected in Landsat Thematic Mapper satellite imagery.

Interestingly, observations I made in the Dry Tortugas last month suggest that the reefs there are showing slower decline than in the Key West area. So it appears that corals in the Dry Tortugas are not stressed to the same degree as in the ″mainland″ Florida Keys. Coral Cover on Bird Key has decreased an estimated 20-25% as opposed to the 5-10% for Cawsfort Reef. These reefs are buffered from Key West by 65 miles of ocean which may help to explain why these reefs are somewhat healthier than the Keys reefs. Although the reefs in the Dry Tortugas are in marginally better condition, nevertheless, they are experiencing considerable decline and there is cause for serious concern.

NESTED LEVELS OF STRESS

Based on my systematic examination of the decline of coral reefs in the Florida Keys, I have drawn several conclusions regarding root causes of the collapse of reef ecosystems. Some of the increased stresses that corals are now exposed to are simply amplifications of naturally occurring stress, and others are new within the lives of presently living corals. Many of these stresses are nested within each other and probably amplify the intensity on any single factor. Reefs in all the tropical seas are threatened by degraded ecological conditions that originate locally, regionally, and from the shores of distant continents (Bryant et. al., 1998; Hatziolos et. al 1998). Remote oceanic reefs are effected by global change such as elevated ocean temperatures and increased ultraviolet light. Reefs in coastal waters are effected by these factors and additional stressors such as increased sediments, carbon, nutrients and harvesting. Coastal reefs near population centers have the increased pressures from sewage, watershed effluent, garbage dumping, and greatly increased levels of harvesting.

A significant portion of reef degradation may be related to watershed lands that have been altered from their natural state. Generally, natural terrestrial ecosystems tend to be conservative and export little in the way of nutrients, carbon, and sediments. Agriculture, urbanization, and deforestation reduce the capacity of terrestrial ecosystems to trap and retain these materials, and the rivers become overloaded with sediments, nutrients, and toxic chemicals. Simple runoff becomes an effluent that can have a significant negative influence on water quality. The addition of fertilizers, organic carbon, and urban and commercial dumping further enrich the watersheds effluent as it flows into the sea. Although concentrations may be diluted, these agents may still affect reef health. Coral reef ecosystems have evolved to be very efficient in trapping and retaining nutrients even in concentrations that, though technically beyond the level of detection, are still ecologically significant. This creates a situation in which materials from a diffuse array of sources contribute to pervasive levels of chronic stress to reefs.

In the Florida Keys, the question is frequently asked, which is the single factor mainly responsible, sediments or nutrients? It may well be that the factor is actually the accumulation of a series of nested stresses which axe as local as fishing and tourism; as regional as cities, agriculture, and industry; and as global as deforest-

ation of the rainforests, the hole in the ozone, and the greenhouse effect. Each factor compounds upon the others, and the vitality of the reef declines.

Locating the sources of increased nutrient and sediment levels and other stressors, has proved as elusive as defining the nested levels of stress. Point sources are usually known and can be controlled through permitting processes. Non-point sources are much more difficult to define. The Florida Keys are downstream from almost every source of sediment or nutrient in the Caribbean basin and Gulf of Mexico. Just upstream of the Keys, the effluent of cities, towns, and farms slowly bleeds into the sea through canals, rivers, and coastal bays. The area extends into the watershed of the Mississippi River and continues throughout the Caribbean Sea. For example, sediments from as distant as the Orinoco or Amazon Rivers have been identified on Carysfort Reef (Dustan, unpublished).

Point sources, such as sewage outfalls or agricultural irrigation canals, are steady, well defined, and easily traceable. Leaching from shallow septic tanks, urban lawns, and run-off from agricultural and deforested lands are considered non-point sources of pollution. They are widely dispersed and less consistent. Both types contribute to the hydraulic flow that pushes sediments, nutrients, and contaminants into the sea. In Florida, some of these materials wash into the sea along the west and east coasts of the peninsula, some flow through the Everglades, and others emanate from the Mississippi and lands that are farther upstream. On a larger geographical scale, the over-addition of nutrients, organic carbon, and sediments from land use practices are responsible for coastal hypoxia near river mouths and deltas. Many of these areas are defined as dead zones because the water is depleted of oxygen to the extent that it will not support aerobic metabolism (Cooper, S. and G. Brush, 1991; Malakof, 1998; Costanza et al, 1998). On still a larger scale, coastal ocean current patterns circulate coastal pollutants and their effects throughout the seas.

Corals with weakened immune systems are more susceptible to disease than healthy corals. In the Florida Keys, disease is a significant source of colony mortality, and appears to be on the increase. Additionally, coral recruitment and regeneration rates are low and appear to be decreasing. Increased sedimentation will smother corals, increased nutrients in the absence of elevated herbivory will result in algal overgrowth, elevated temperatures will promote bleaching, and diseases do seem to be more prevalent in areas close to centers of human habitation. Unfortunately for the coral reefs of the Florida Keys, these stresses seem to have converged to produce a suite of multiple stressors which are pushing the reefs into a state of ecological collapse from which recovery may not be possible within a human lifetime. It is not an exaggeration to suggest that the world's coral ecosystems, through neglect, are suffering severe ecological degradation. Some suggest that, like tropical rain forests, these biomes will continue their downward spiral. Events such as the mass bleaching with subsequent mass mortality in the Maidives in May 1998, raise the question of the influences of global scale anthropogenic stress such as global warming affecting the health of reefs. Ultimately, coral reef ecosystem health may be a sensitive indicator of overall oceanic health and changing climate, and can help to focus our attentions on preserving the ecological integrity of our global ecosystems.

CORAL REEF CONSERVATION GRANTS

The Cousteau Society strongly supports provisions in S. 725 and S. 1253 establishing an innovative financing mechanism for coral reef conservation. The availability of these funds will help to foster innovative projects that reward entrepreneurial and creative approaches to coral reef conservation. Using federal grants to leverage coral conservation projects developed at the local level also provides an important means for involving communities and concerned citizens in this effort. To assure success, however, adequate financial resources must be authorized and appropriated.

One positive aspect of this bill is its apparent goal of putting money into the hands of "little" people. Much of the research I have described was accomplished with small grants or personal funds. Independent investigator science, not big programs, has been responsible for most of the creative and insightful science done on coral reefs. Much of the current reef conservation is accomplished by similar people, not large programs. Even today, our Coral Reef Monitoring Project ("CRMP"), the largest, most precise monitoring project of its kind is done by people with a passion for their work. As large as our project is, it is still underfunded. Our institutions have cut then' indirect rates, and people work for reduced wages because they love coral reefs. From my reading of the bill, it focuses on putting funds into the hands of "reef" people, not programs. Larger programs may add value to coral reef conservation efforts, if they are well-designed and implemented, however, they often be-

come unwieldy or lose focus on the goal of enhancing direct protection or conservation actions. This bill will provide support where it is needed right now.

For example, the following initiatives could be pursued by innovative public/private grants:

- Develop and test small-scale innovative alternative sewage systems
- Encourage a reef gardening approach to care for local reefs
- Support Local conservative issues.
- Fund scientific process studies into coral health and vitality
- Fund local case studies.
- Encourage education activities
- Fund graduate student projects related to coral reef conservation
- Develop innovative boater awareness programs - Support the installation and maintenance of mooring buoys
- Develop the mariculture of coral reef organisms for the aquarium trade

In addition, modest funding also could stimulate educational and public outreach activities, including:

- Support the development of strong and continuing broad-based educational programs at all levels to increase awareness of the impact of human activities on coral reef ecosystems.
- Increase global awareness that ultimately, coral reefs may be a vital indicator of overall oceanic health and changing climate.

I have noted that stress to coral reefs resides within a series of nested scales. As the scale increases, the magnitude of the problem increases and it becomes more difficult to ameliorate environmental pressures. The legislation before you today, S. 725 and S. 1253, represents an important step in the fight direction. Assuring the future of the nation's coral reefs will depend on our willingness to invest in protecting and maintaining their health. Proposals to address water quality such as H.R. 673, the Florida Keys Water Quality Improvement Act (sponsored by Congressman Deutsch (D-FL)), also should be considered. The Committee also should consider recommendations under consideration by the Coral Reef Task Force. Clearly, the need for additional funding over the long term to protect these resources must not cause us to shirk from our obligations. More comprehensive legislation will be needed in the future if we are to assure the survival of the nation's coral reefs for the benefit of present and future generations.

CONCLUSION

In closing I would like to say that I have painted a grim picture for the future of the reefs of the Florida Keys. It is based on my own scientific data collected since 1974. I met Captain Cousteau the same year I began my work in Florida. He shared his personal observations on the degradation of coral reefs in the Red Sea, and we talked of the changes that humans caused to reefs. Neither of us ever imagined that ecological events would progress this far so fast. However, Captain Cousteau felt that people want to protect things that they love and cherish.

The reef is a structure of ancient ecological design. Its physical morphology, its orientation to the forces of the sea, and its community structure have been tested and molded by time and natural selection. Reefs have weathered global climate shifts, plate tectonics, and dramatic sea level change. The reef community has evolved into a fully integrated marine civilization superbly adapted to a nutrient impoverished ocean. Its design for ultimate conservation of nutrients through symbioses and detailed trophic interactions has made it vulnerable to small external perturbations. This delicate complexity makes coral reefs vulnerable to changing environmental conditions, particularly temperature, sedimentation, increased nutrient concentrations, and overharvesting. Ironically, the many values of coral reefs—as a fisheries resource, for coastal protection and building materials, and as tourist attractions—now are contributing to their steady and rapid decline and disruption of their biological integrity. We need to factor these realities into an approach for long-term reef conservation.

As stewards of these valuable marine resources, the United States has a responsibility to continue to take steps to conserve coral reefs within its jurisdiction. Congress has enacted important legislation to meet this challenge, and supported the establishment of marine sanctuaries to safeguard specific coral reef ecosystems. More than ever, coral reef conservation efforts are essential to raise public awareness about the importance of humanity' s impact on the marine environment, before current trends becomes irreversible. Clearly, ″business as usual″ is no longer acceptable if we are to conserve these critical resources for the benefits of present and fu-

ture generations. We stand on the threshold, but it is not too late to reverse the tide of destruction.

Madame Chair, members of the Committee, the legislation before you today is the first step in this direction. The Cousteau Society stands ready to continue to work with you and the Committee toward the goal of enhanced conservation of coral reef ecosystems. As a start, I have attached a series of recommendations compiled by the Cousteau Society intended to highlight opportunities for enhanced conservation for coral reefs, and in particular, recommendations for specific scientific research.

Thank you.

THE CONSERVATION OF CORAL REEFS AN OPPORTUNITY FOR ACTION

JUNE 30, 1999

"Evolution produces a very few new species every million years. If we are to assume that nature can cope with our feverish developments, it is probable that mankind would be submitted to the fate of the dinosaurs. We have a moral obligation toward our descendants, a patrimony that we must protect if we ourselves are to survive."

JACQUES-YVES COUSTEAU

RECOMMENDATIONS FOR CONGRESS AND THE ADMINISTRATION

• Enact comprehensive coral reef legislation to address the root causes of coral reef decline.

• Strengthen existing federal programs directed at coral reef conservation and continue strong support for the implementation of the Presidential Executive Order on coral reef protection. Provide additional conservation incentives for States, territories, or countries with coral reefs or watersheds that affect coral reefs, to conserve these important resources.

Establish an ongoing interagency working group, including scientific and policy experts, to identify human activities which adversely impact U.S. coral reefs, and to develop recommendations to eliminate or minimize such harm. Recognizing that "rivers are the roots of the ocean," the group should address land, water and atmospheric sources of pollution by developing comprehensive watershed management programs and other management tools, including integrated coastal area management.

• Actively engage the scientific community by increasing federal support for coral reef research. Establish an independent scientific panel to advise federal agencies on coral reef conservation and related efforts, including the National Marine Sanctuary Program, responsibilities in U.S. territories and international initiatives.

• Establish water quality goals and standards (including sediment and nutrient loading, and biological oxygen demand) compatible with the maintenance of healthy reef systems. Focus attention on preserving the ecological integrity of the reef system and its watershed, not simply the physical reef structure. Reduce inputs of excessive nutrients, untreated or partially-treated sewage, sedimentation and other pollutantsintegrity of reefs as they can contribute increased nutrient and sediment loading from distant sources.

• Increase efforts for coral reef restoration with emphasis on whole ecosystem restoration that includes attention to ecologically-connected watershed and airshed components. Address issues at the appropriate geographic scale, including local, regional, and global levels. Focus on the design and implementation of best practices and support appropriate demonstration projects.

• Establish national and international programs to utilize remote sensing capabilities to map and monitor the global distribution and health of coral reef communities and identify potential hazards to their future. Develop a program within NASA's Earth Science Enterprise to map and monitor the global distribution and health of coral reef communities and identify potential hazards to their future (and make this information widely available through the Internet). Remote sensing data should be combined with standardized field sampling and Geographical Information Systems analyses. NASA should consider using Space Station Freedom to monitor reefs in equatorial areas.

• Promote the establishment and expansion of marine protected areas and strengthen support for applied scientific study and monitoring, especially in core nursery and recruitment zones. Establish the Dry Tortugas as an ecological reserve, and expand the Flower Garden Banks, Gray's Reef and American Samoa

Sanctuaries to assure their future viability. Consider immediate sanctuary designation or protected area status for the northern Hawaiian Islands and the U.S. Pacific Islands: Johnston, Palmyra Atolls, Kingman Reef and Howard and Baker Atolls.

• Increase aid for coral reef conservation to American tropical trust territories in the Pacific and Caribbean regions, principally Guam, American Samoa, and Puerto Rico. Assure adequate Coast Guard funding to help patrol remote reefs and deter illegal fishing activities, remove derelict shipwrecks, and enforce conservation regulations.

• Ensure that that the knowledge and means for coral reef management is transferred to tropical developing nations where most of the world's coral reefs are located. Expand efforts by the Agency for International Development and the Peace Corps to address coral reef conservation concerns in developing countries, focusing on integrated coastal area management, fisheries conservation, and education and community involvement. Respect and incorporate local knowledge into such management schemes.

• Assure that economic demands and trade do not result in further harm to reefs. Support the establishment of certification programs to eliminate the use of cyanide in fish capture, and restrict the trade in coral or coral products that threaten reef communities. Consider the use of sanctions for nations that engage in illegal fishing practices such as the live fish trade, cyanide fishing, or the use of dynamite. Consider adopting debt for nature swaps as a tool for reef conservation.

• Strengthen U.S. involvement and financial support for the International Coral Reef Initiative, and support full implementation of the Biodiversity Convention and the Jakarta Mandate on Marine and Coastal Biodiversity, along with other international agreements on marine protection and conservation.

• Recognize the critical role of education by supporting the development of strong and continuing broad-based educational programs at all levels to increase awareness of the impact of human activities on coral reef ecosystems. Work with key parties to increase global awareness that ultimately, coral reefs may be a vital indicator of overall oceanic health and changing climate.

RECOMMENDATIONS FOR RESEARCH

• Test the hypothesis that coral reefs are harbingers of change in response to an anthropogenic alteration of the physical and chemical environment of the sea.

• Create a GAP analysis process to identify geographic areas where baseline data on the distribution and health of coral reef ecosystems is not available.

• Develop remote sensing protocols to detect on-going ecological perturbations that impact coral reefs and to estimate the rates of relevant ecological processes such as primary production, calcification, and the impact that reefs have on surrounding seas.

• Support the establishment of a scientifically rigorous global coral reef monitoring network at selected locations in all the tropical reef regions of the world that is designed to detect change at the community level.

• Develop research initiatives that focus on defining the linkages between habitat degradation in temperate and topical nations with coral reef health and vitality.

• Strengthen support for applied scientific study and monitoring, especially in core nursery and recruitment zones.

• Support the establishment of a Center for the Study of Diseases of Marine Organisms which is closely linked to the Center for Disease Control.

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Senator SNOWE. I appreciate that, Dr. Dustan. It has been very helpful as well.

You were showing a reef that was destroyed by a boat years ago and it is still in the same condition. Can that be rebuilt?

Dr. DUSTAN. You could rebuild it if the appropriate quality of the environment were there. There have been some wonderful reconstructions, mostly by Harold Hudson down in the Florida Keys. In some places he has taken these corals and cemented them back in place, and they die now.

It used to be, for example—in the first year after the Dry Rocks wreck, the corals regrew dramatically. But then about 5 years later they started to die, in the eighties. That particular coral, Acoopora palmata, which I think is so amazing, was the signature coral of the Florida Keys. That is the coral you think of, elkhorn coral. Last year we had a very serious discussion on the coral list-server about whether or not it should be put on the Endangered Species List.

Senator SNOWE. Thank you. I appreciate it.

Dr. Hunter, your equipment is ready.

STATEMENT OF CYNTHIA HUNTER, PH.D., CURATOR, WAIKIKI AQUARIUM, UNIVERSITY OF HAWAII

Dr. HUNTER. Yes, it is.

Senator SNOWE. OK.

Dr. HUNTER. Thank you, Madam Chairwoman, and thanks to your great staff for their prompt assistance with a dead battery.

Senator SNOWE. Are they technologically proficient?

Dr. HUNTER. They are awesome.

I am Cynthia Hunter. I am the Curator at Waikiki Aquarium, University of Hawaii. I have been working around reefs in the Caribbean and more recently in the Pacific for the last 20 years.

In the most expedient use of your time and the committee's time and in hopes that a picture really does convey a thousand words, and because the reefs of the Pacific are such a long way from Capitol Hill, we have prepared about a three and a half minute video clip.

I wanted to explain, and maybe you will relay this message to Senator Breaux, more about what corals are, so we can better understand their vulnerability. I believe this is very important both for the public and for the committee, and that way we will better understand the need for immediate actions.

Briefly, reefs are not rock structures, but they are composed of thousands of organisms living interdependently in a very complex and productive ecosystem. It is all based on the living corals themselves. They produce the structure and the food base for what we call coral reef ecosystems.

Corals are living animals, but they do not look like us or cows or fish, certainly. But they carry on the basic processes of life. That is, they have need for nutrition, they grow in size, and they reproduce.

The key to corals as reef builders is that, as Dr. Dustan referred to, they produce a hard mineral skeleton. This again is the reef framework. Some people think perhaps that coral reefs are rocks based on the fact that they have these mineral skeletons. But it is this thin layer of living coral tissue that can produce a coral colony. A single individual colony may easily grow to the size of this room.

How do they do that? Again, Phil made reference, corals have a secret. It sounds wild, but it's true. They have single-celled algae: plants that live inside their cells. These plants use the energy from the sun through the process of photosynthesis and they provide carbohydrates or food energy to the corals, and that allows them the energy to produce this enormous reef framework.

Corals grow upward and outward, some very quickly, up to a quarter meter a year, but more often on the order of one to two centimeters each year.

Fish, and other creatures of course, urchins, lobsters, etcetera, depend on the corals and associated organisms and seaweeds for food and shelter.

So this sets the stage for our understanding of the threats to reefs. Runoff and sediment, of course, decrease light. Increased fertilizers cause an overgrowth of algae over the slower growing corals. Increased stress, such as from elevated sea water temperatures, will result in coral bleaching, and I want to explain a little bit more what this bleaching is.

But I will start with the video, please, now.

Thank you again for your patience as we get to this tape.

[Videotape.]

I am talking about Pacific reefs specifically today and they are a very different picture than what we have been seeing in the Atlantic and the Caribbean lately.

Most of us see fish on a coral reef, but of course this is the major player. This is a closeup of the major players.

Again, a typical reef of the Pacific. The major players are the "rocks" in the background—not rocks atall, but living corals. Thousands of organisms live inside the holes, nooks, and crannies of these corals.

On closer inspection, to the untrained eye they may still look like rocks. These are two of the most common coral species in the Pacific Ocean. When we look closer, though, you will see that they are a wall of mouths. They are basically tiny mouths surrounded by rings of tentacles. Through time lapse photography, you can see the anemone-like structures actually move, but not far. They are attached to the bottom. That is why corals cannot escape runoff and sedimentation.

This is how the anemone-like coral actually produces the skeleton underneath it. It sits on a platform of the coral skeleton.

Corals do feed. This is a tidbit offered to a mushroom coral that can actually open its mouth and ingest the organism. But again,—reef-building corals are more dependent on these single-celled algae that live inside their cells, a million per square centimeter or more

of these little algae. They are solar cells, power packs that contribute to the majority of the coral's energy needs.

When corals are stressed, these algae are removed from the association and the animal appears white.

I promised you sex: reproduction. These are corals, captive corals at Waikiki Aquarium that have been there for about 12 years. This video was taken 2 weeks ago at new moon. At 9 o'clock at night, guaranteed, every June, at new moon, they will release eggs and sperm into the water. The eggs and sperm are fertilized there and form a coral larva or embryo like this, that may swim for days, weeks or months, before settling on the reef to grow into a new colony.

This next part you will need to watch quickly. This is coral growth upward and outward. I will show you one more time, upward and outward. That is two months worth of coral growth, in a very quickly growing species.

This coral is very large, probably more than 200 or 300 years old. We expect that it was already a large coral colony when Captain Cook sailed into Kealakekua Bay on the Island of Hawaii, when this country was still in its infancy.

Of course, reefs provide enormous economic benefit in the Pacific islands from fisheries, tourism, shoreline protection, and the basic biological diversity that we have heard so much about already this afternoon. Reefs are beset by a number of challenges. I hope this explanation has helped explain why they are sensitive on a number of fronts.

To preserve and restore reefs in the U.S. Pacific islands, we need to develop and enforce fisheries policy and coastal land use policy. We need to establish marine protected areas. We need to assess, map, and monitor current reef status, but not only current reef status. We need to assess and monitor the responsive of coral reefs to management actions that we take. We need education, about the importance and fragility of reefs, and also for the training of managers and scientists who will be charged with the preservation of these ecosystems into the next millennium.

Thank you very much.

[The prepared statement of Dr. Hunter follows:]

PREPARED STATEMENT OF CYNTHIA HUNTER, PH.D., CURATOR,
WAIKIKI AQUARIUM, UNIVERSITY OF HAWAII

Madam Chair and members of the subcommittee, thank you for the opportunity to testify in support of coral reef conservation.

For the past decade, assemblies of scientists, community members, and resource managers have become increasingly concerned about the health and sustainability of coral reef ecosystems. A substantial body of evidence now shows us that many coral reefs are in decline or threatened on both local and global scales. Immediate and decisive action is necessary to protect reefs and reef resources from further degradation.

Coral reefs are alive—hey are composed of millions of entities living in complex and interdependent associations. Microscopic algae living inside coral cells provide the food and energy that enable their hosts to secrete their skeletons—ediment or turbid water blocks the light they need to survive and grow. Introduced seaweeds grow over native coral, resulting in the ultimate loss of reef structure. Some species of butterflyfish or blennies eat only a few types of corals—ecline of these corals results in decreasing numbers of butterflyfish, followed by declines in predators of butterflyfish and blennies, and so on up the food chain. These tightly-linked associations are what make reef ecosystems particularly vulnerable to over-harvest, destructive fishing and land-use practices, and pollution.

Like redwoods, corals may live for hundreds or even thousands of years. A semi-truck sized coral head in Kealakekua Bay today existed (although at a much smaller size) at the time when Captain Cook first sailed to Hawaii in 1778 (and when our nation was in its infancy). Growing on the order of a centimeter a year, corals such as this provide habitat and a food base for thousands of other reef species.

Coral reef ecosystems are of nearly incalculable importance to Pacific island economies. They provide natural shoreline protection, an attractive tourism base, biological diversity, and essential fisheries habitat. Nearly a million people inhabited the Hawaiian Islands prior to western contact, living sustainably on food and resources obtained from the land and the sea. However, this was before the advent of combustion engines, chemical fertilizers and pesticides, dredging, asphalt, and jets bringing an additional 3 million visitors each year. We must find new ways and management principles to allow the sustainable use and enjoyment of remaining reef resources.

Funds are urgently needed to establish, maintain and monitor marine protected areas; to conduct research to develop risk management protocols and methods for reef restoration; to implement current management guidelines and enforce regulations; to implement community-based management strategies; and for the education of our children and the broader public on what they can do to protect coral reefs.

The Coral Reef Protection Act of 1999 is a significant and timely move toward the preservation of these unique and productive ecosystems. Full funding of this important legislation will provide a powerful and necessary mechanism to build effective management capabilities.

Thank you.

Senator SNOWE. Thank you, Dr. Hunter.

Mr. Collins.

STATEMENT OF MICHAEL COLLINS, FISHING GUIDE, ISLAMORADA, FLORIDA

Mr. COLLINS. Madam Chair, thank you for the opportunity to come here today. For the record today, my name is Michael Collins. I am a resident of the Florida Keys and have been a fishing guide in the Keys and the Everglades for the last 24 years.

I was one of the original members of the Florida Keys National Marine Sanctuary Citizens Advisory Council. I remained a member until 2 weeks ago. I was chairman of the council at the time it produced its recommendations for the sanctuary management plan and was chairman at the time that plan was submitted to the Governor and cabinet for their approval and approval of the participation of the State as an equal partner.

As you no doubt heard, there was a considerable amount of debate and controversy over the development of that plan. The controversy was, at least to me, something of a shock. The advisory council process we employed was the most open participatory process ever used for resource management on a broad scale. I remain a huge believer in that process. We have used it as a model in developing the restudy of the Central and Southern Florida Project, which is the foundation of the restoration of the Everglades, and in so doing achieved a consensus that few would have believed possible at the start.

That plan will come to Congress tomorrow morning. I attended a press conference earlier today where sugar farmers, fishermen, national and State environmental organizations, and just plain citizens stood up to announce their support of that plan, something that we never would have believed possible, and I do not believe would have been possible if we had not used the model of the sanctuaries advisory council.

Where the process broke down and what really was responsible for the uproar were the times when it was not open and objective and participatory. The original presentation of the closed areas proposed for the sanctuary was a disaster. NOAA allowed one of its scientists to walk in and propose a minimum of 20 percent of the sanctuary be set aside in a no-take zone, with predicted benefits that not a single fisherman in the room believed.

To deal with that credibility hit that event produced, a community outreach program was planned. Contrary to the advice of several of the council members, myself included, NOAA gave the job, not to a member of the community with broad-based business and social contacts, but to an NGO, the Nature Conservancy. To find out how well that worked, you can refer to the GAO report on the subject.

When we finished our work on the draft, it disappeared behind the Beltway for a year and reappeared with a couple of new concepts in it that came within a whisker of killing the whole deal. The worst was a provision that gave the sanctuary superintendent the sort of regulatory authority that a national park superintendent enjoys. I will not comment on whether or not that authority is appropriate for a national park, but I can tell you for sure that very few in the Keys thought it appropriate for a marine sanctuary.

In spite of all the above, and it is my belief—in spite of all the above and it is my belief in part because of all of the above, we now have a national marine sanctuary in the Keys that is not a source of controversy. In spite of all the above, we just had the proposal for the last and largest of the closed areas, Tortugas 2000, receive the unanimous support of the environmentalists, commercial and recreational fishermen, and just plain citizens who sat on the advisory panel.

The reason for the above I believe is that after all the bureaucratic foulups, NOAA, the advisory council, and all of us had to let the process become open and objective and participatory in reality just to survive. When you go through the sort of microscopic examination that the sanctuary advisory council was put under for the several years that it took us to wrap up the management plan, you learn very quickly that the only defense you are ever going to have in dealing with the press and your fellow citizens is to be standing on the soundest and most obvious science that you can get your hands on. If you do not base your decisions on pure scientific fact, your neighbors and the press will come after you almost every time. It was a tough lesson to learn, but I believe we learned it.

In addition to the above lesson, I believe that we learned that in selling sanctuaries we should not oversell them. The benefits of the sanctuary program are real, but they are not as dramatic as we originally were told. Education and volunteer programs will eventually provide far more benefit to the resource than regulations we simply do not have the money to enforce. But that benefit will take longer to realize.

One benefit that as a stand-alone makes the sanctuary program worth having is the forum that it provides. In mandating the national marine sanctuary, Congress sent along instructions for a water quality protection program to the Keys. As part of that they

told us to set up a water quality steering committee that is composed of the secretaries of the state agencies with water quality responsibilities, regional administrators from EPA, a wide variety of local citizens.

I would suggest to you, after 10 years of uninterrupted service on advisory panels on resource management, that one panel may be the most important one I have ever served on. The water quality issues raised by the sanctuary became the foundation for the Everglades restoration. It was the questions that were raised regarding the impacts that Senator Breaux correctly inquired into of fresh water on marine systems that led us to ask the questions that brought us to the eventual restoration, we believe, of the Everglades, with Congress' kind permission of course.

I would suggest that the establishment of that water quality protection program and the sanctuary advisory council alone would justify the establishment of a marine sanctuary.

Regarding the reauthorization of this program, I would simply suggest that for the establishment and management of all marine sanctuaries you take whatever steps are necessary to make sure that an open, objective, and participatory process is employed in all decisionmaking.

Thank you.

Senator SNOWE. Thank you, Mr. Collins.

Finally, Dr. Connor.

STATEMENT OF MICHAEL S. CONNOR, PH.D., VICE PRESIDENT FOR PROGRAMS AND EXHIBITS, NEW ENGLAND AQUARIUM, CENTRAL WHARF, BOSTON, MASSACHUSETTS

Dr. CONNOR. Thank you, Madam Chair. I thank you for this opportunity to testify about the reauthorization of the National Marine Sanctuaries Act, and I want to thank you also for your support on behalf of bluefin tuna research. We also do right whale research in your coastal town of Lubeck, have worked with Maine's fishing community on a series of lobster forums, and are working closely with a marine mammal stranding facility that you have supported strongly in the past, and we appreciate that work.

I am here today representing the New England Aquarium, which greatly benefits by its proximity to the Studds Stellwagen Bank National Marine Sanctuary. Our mission at the aquarium is to present, promote, and protect the world of water, and each year we educate approximately 1.4 million visitors about our planet's lakes, rivers, and oceans.

Next week we will open the Nation's first digital interactive immersive computer theater. We have chosen to debut this theater with a program about Stellwagen Bank. The experience introduces visitors to the environmental threats facing Stellwagen Bank, allows them to choose from a variety of management actions to protect the habitat, and then predicts the future health of Stellwagen based on the individual and group decisions made by these visitors.

Stellwagen Bank, located 25 miles east of Boston, was designated a national marine sanctuary by Congress in 1992, primarily to protect it from a proposal to construct a floating gambling casino from sand and gravel mining, and oil and gas development. Sanctuary

designation did protect Stellwagen Bank from those threats, which have since diminished in their importance.

Since then the public has come to value Stellwagen as the most important coastal underwater habitat in New England, a special place in which visitors can experience the marine realm first-hand, just as they might visit a national park to experience an old growth forest or a geological wonder.

Stellwagen Bank warrants its special designation as a marine sanctuary because of the unique characteristics of its geological history, topography, and coastal circulation that combine to allow the formation of dense and abundant aggregations of bait fish and plankton. These aggregations make Stellwagen Bank a favorite feeding ground for humpback whales, right whales, and commercially important fish.

Stellwagen Bank has long been important to the Massachusetts economy for its fishery resources and lately is a favorite site for whale watching. Whale watching boats carry nearly one million passengers each year, generating more than $20 million in revenues.

The comprehensive resource protection provided by the National Marine Sanctuaries Program is especially important to Stellwagen Bank, which is threatened by a variety of activities, including overfishing, habitat disruption, coastal pollution, atmospheric deposition, shipping, and ship strikes of whales. While each of these activities is regulated by other programs, only through the Stellwagen Bank Marine Sanctuary can the cumulative impacts of all these threats be addressed and managed.

Senator Kerry earlier was asking Ms. Yozell about how specific problems caused by lack of funding. In Stellwagen Bank we see problems from bottom trawl damage, which occurs extensively over the bank. You can easily see the scour marks of where trawls have dragged the bottom. There has been fishery closure areas through the fisheries management council, but the impacts of those closures have not been well monitored because of lack of funding. As a result, we are not able to determine whether or not the closures are doing a good job at protecting the bank.

This is just one example of how increased funding would help us do a better job at protecting the Stellwagen Bank Sanctuary.

The sanctuary program has been seriously underfunded relative to its mission and importance to the Nation. Providing adequate resources for the sanctuary program is the most important issue that Congress should address in its reauthorization of the act.

To put the budget in perspective, our aquarium, the New England Aquarium, this year spent about 50 percent more on our new exhibit on Stellwagen Bank than NOAA's budget for the entire year for bank protection, management, education, research, and enforcement for its 638 square miles. This is a serious mismatch in funding and importance, and the mismatch is not restricted to the Stellwagen Bank National Marine Sanctuary alone.

Additional funding for the sanctuary program would allow NOAA to enhance conservation efforts by improving the mapping of critical habitats and other important resources within the sanctuaries, speeding the development of management plans, and monitoring the effectiveness of key management decisions. Perhaps most im-

portantly, the additional funding would allow the expansion of environmental education programs that would help people understand these critical habitats and what they can do to minimize the impacts of human activities.

Armed with this information, the public would become effective advocates for these precious natural resources and insist upon appropriate levels of support to ensure their protection.

We are optimistic about future funding opportunities. We are encouraged by the administration's NOAA Lands Legacy Initiative, which would increase funding for the program, as well as Senator Kerry's proposed Coastal Stewardship Act. Existing funding resources could also be more effectively used by improving coordination between other parts of NOAA and the sanctuary program.

The sanctuary program is still in its infancy and should be encouraged to experiment and evaluate new management tools. Sanctuary governance also warrants experimentation. The aquarium is pleased to serve as a member of the Stellwagen Bank Advisory Council. As Mr. Collins previously testified, advisory councils are one of the most important things the sanctuaries can do. Advisory councils can be effectively used to generate consensus for sanctuary management proposals since they represent many of the diverse user groups in the sanctuary region. Advisory councils can help develop consensus before the management plans are formally promulgated.

Madam Chairman, in conclusion these marine sanctuaries are national treasures. I commend you on your efforts on behalf of the national marine sanctuaries program and I thank you for the opportunity to provide this testimony.

[The prepared statement of Dr. Connor follows:]

PREPARED STATEMENT OF MICHAEL S. CONNER, PH.D., VICE PRESIDENT FOR PROGRAMS AND EXHIBITS, NEW ENGLAND AQUARIUM, CENTRAL WHARF, BOSTON, MASSACHUSETTS

Madam Chairman, Members of the Subcommittee, thank you for this opportunity to testify concerning the reauthorization of the National Marine Sanctuaries Act. I would also like to take this opportunity to thank Senator Kerry for his tireless efforts on behalf of the National Marine Sanctuaries Program and particularly the designation of Stellwagen Bank as a marine sanctuary. I am here today representing the New England Aquarium, which greatly benefits by its proximity to the Studds Stellwagen Bank National Marine Sanctuary. Our mission at the Aquarium is to present, promote, and protect the world of water, and each year we educate approximately 1.4 million visitors about our planet's lakes, rivers, and oceans. Next week we will open the nation's first digital, interactive, immersive computer theater. We have chosen to debut this theater with a program about Stellwagen Bank. The experience introduces visitors to the environmental threats facing Stellwagen Bank, allows them to choose from a variety of management actions to protect the habitat, and then predicts the future health of Stellwagen based on the individual and group decisions made by these visitors.

Stellwagen Bank, located 25 miles east of Boston was designated a national marine sanctuary by Congress in 1992 primarily to protect it from a proposal to construct a floating gambling casino and from sand-and-gravel mining and oil and gas development. Sanctuary designation did protect Stellwagen Bank from those threats, which have since diminished in their importance. Since then, the public has come to value Stellwagen as the most important coastal underwater habitat in New England' a special place in which visitors can experience the marine realm firsthand, just as they might visit a national park to experience an old-growth forest or geological wonder.

Stellwagen Bank warrants its special designation as a marine sanctuary because of the unique characteristics of its geological history, topography and coastal circulation, that combine to allow the formation of dense and abundant aggregations of baitfish and plankton. These aggregations make Stellwagen Bank a favorite feeding ground for humpback whales, right whales, and commercially-important fish. Stellwagen Bank has long been important to the Massachusetts economy for its fishery resources, and lately as the favorite site for whale watching. Whale watching boats carry nearly 1 million passengers each year generating more than $20 million in revenues.

The comprehensive resource protection provided by the National Marine Sanctuaries Program is especially important to Stellwagen Bank, which is threatened by a variety of activities including over-fishing, habitat destruction, coastal pollution, atmospheric deposition, shipping, and ship strikes of whales. While each of these activities is regulated by other programs, only through the Stellwagen Bank Marine Sanctuary Program can the cumulative impacts of all these threats be addressed and managed.

The National Marine Sanctuaries Program (NMSP) has been seriously underfunded relative to its mission and importance to the nation. Providing adequate resources for the NMSP is the most important issue that Congress should address in its reauthorization of the Act. To put the budget in perspective, the New England Aquarium has just spent about 50% more on its new immersive theater exhibit on Stellwagen Bank than NOAA's budget this year for the entire Stellwagen Bank sanctuary program. At current funding levels, Stellwagen has only three full-time staff members to provide the management, resource protection, enforcement, research, and education activities for its 638 square miles. There is a serious mismatch in funding and importance, and the mismatch is not restricted to the Stellwagen Bank National Marine Sanctuary.

Additional funding for the NMSP would allow NOAA to enhance conservation efforts by improving the mapping of critical habitats and other important resources within the sanctuaries, speeding the development of management plans, and monitoring the effectiveness of key management decisions. Perhaps most importantly, the additional funding would allow the expansion of environmental education programs that help people understand these critical habitats and what they can do to minimize the impacts of human activities. Armed with this information, the public would become effective advocates for these precious natural resources and insist upon appropriate levels of support to ensure their protection.

We are optimistic about future funding opportunities. We are encouraged by the Administration's NOAA Lands Legacy Initiative, which would increase funding for the program, as well as Senator Kerry's proposed Coastal Stewardship Act. Existing funding resources could also be more effectively used by improving coordination between other parts of NOAA and the NMSP. In particular, NOAA's Coastal Services Center in Charleston, South Carolina produces a number of products that would be valuable tools for all Sanctuary managers.

The Sanctuary program is still in its infancy and should be encouraged to experiment and evaluate new management tools. Sanctuary governance also warrants experimentation. The Aquarium is pleased to serve as a member of the Stellwagen Bank Advisory Council. Because Stellwagen's Advisory Council represents many user groups with different concerns, we believe these councils can be effectively used to generate consensus for sanctuary management proposals before new management plans are formally promulgated.

Madam Chairman, in conclusion, these marine sanctuaries are national treasures. I commend you on your efforts on behalf of the National Marine Sanctuaries Program and thank you for the opportunity to provide this testimony.

Senator SNOWE. Well, I thank all of you for sharing your perspectives and your experience in this area that, as Senator Breaux was mentioning, has strong bipartisan support. There is no question that we will address these issues this year. The question is going to be how and what, will be the most effective way in which to lend our support and resources toward these ends.

Let me just ask about coral reefs, Dr. Dustan, Ms. Cooper, and Dr. Hunter. I have included a match requirement for the local conservation grants. In Senator Inouye's, bill he has a 25 percent match requirement and I have a 50 percent. Would your organizations, or the people with whom you work, be able to provide that

kind of match and would that help to create some ongoing continuity in public and local participation by doing this?

Dr. Dustan.

Dr. DUSTAN. I think the match is helpful. I think, for example, the administration of my college sometimes grunts at having to provide a match, but it helps provide release time for faculty and things like that.

I think it gets the community involved. For instance, in the Florida Keys if you went to the diving industry and said, we would like to put out more mooring buoys and we have some money, but you guys have to put an in-kind match toward that, people then get invested in the resource, and I think that is important.

Senator SNOWE. Ms. Cooper.

Ms. COOPER. Thank you. Yes, in my line of work we come by our funds in a difficult way. The 25 percent match is something that is manageable with the in-kind and the 50 percent is a little bit more difficult for us. But we recognize the ability to spread that out throughout many different projects and so we recognize the benefits of that also.

Senator SNOWE. Do you generate a lot of interest among other organizations, and nonprofits?

Ms. COOPER. We do have partnerships with many universities and other NGO's. So yes, we have partners, but not real wealthy ones. It takes extra effort to go out and raise those matching funds, and we are willing to do that, but it takes more time and resources for us.

Senator SNOWE. Dr. Hunter.

Dr. HUNTER. From the university's perspective, again 25 percent seems to be doable, reasonable, and gets us vested in the program definitely. 50 percent is going to be a big stretch for most university research programs that address basic research, assessment and monitoring.

Senator SNOWE. So you think it would be more difficult to reach the 50 percent threshold?

Dr. HUNTER. We would be stretching to do that, yes.

Senator SNOWE. Do you agree that the match is important, the general concept of a match requirement?

Dr. HUNTER. Absolutely.

Senator SNOWE. You all do. Dr. Dustan.

Dr. DUSTAN. I think in some cases it is very important, but in other cases no. There are some issues that are very important to solve and questions need to be answered, and you just want to put the resources toward it and not worry about whether or not there is a match. Sometimes a match can be an obstacle.

Senator SNOWE. So you are not sure that it makes a difference, whether or not it would sustain a program, instead of just being a one-time grant? If you think about it, the government gives all of these grants, as they did in 1997. It would be interesting to catalogue all these grants to see what has happened, what the impact was, and was the project maintained beyond that original grant? We can obviously learn more when we receive information on how many of the 20 grants issued in 1997 are still under way.

Obviously, we do not want the match to be a deterrent. It is not intended to raise the bar, rather to increase involvement at the local level. When you have a greater stake or if you contribute to a project, then you are going to enhance local participation.

Dr. DUSTAN. I think you are absolutely correct, and I think in the Florida Keys you have a lot of people that have moved to the Keys to escape any sort of involvement and they just want to be on their own. There are a lot of individualists down there, and possibly a match could help bring them together.

Senator SNOWE. Ms. Cooper, you mentioned the fact that you thought it was important to take the legislation to the next step and to include verifying and implementing various techniques and conservation methods.

Ms. COOPER. Correct.

Senator SNOWE. With regard to assessing, monitoring, and mapping.

Ms. COOPER. Mapping and enforcement.

Senator SNOWE. Enforcement.

Ms. COOPER. Yes, ma'am. We have been developing technologies for decades now. They have been proven in the laboratory for the most part, and what I am looking for are the linkages to the benefits for marine resource managers. I think that this bill provides an avenue to do that if it adds implementation and demonstration in the field of some of these technologies, so that these managers know what their choices, their options are, for restoration and conservation.

Senator SNOWE. I see. Right now the funds that have been used in the past, cannot be used for that purpose?

Ms. COOPER. Our funding goes toward basic research, basically.

Senator SNOWE. So now you are saying it should be taken a step further to demonstrate this technology?

Ms. COOPER. Exactly, to demonstrate it and then make it available to society, to the resource managers that need to implement it, to conserve and restore the coral reefs.

Senator SNOWE. Dr. Dustan and Dr. Hunter, do you agree with that?

Dr. DUSTAN. In part I do. I think that we do need to develop ways to restore reefs. But again, I think the majority of scientists, of my colleagues, would say that it is futile until we can figure out how to restore the water quality, because reefs have evolved in pristine waters. The great paradox of the reef, as Dr. Hunter has said, the zozanthellae have figured out how to trap and retain nutrients. They are the ultimate recycling system on the planet. So you put them down in tropical waters that are devoid of nutrients, devoid of sediments. All they have is a lot, a tremendous amount, of solar energy and a little bit of plankton to eat, and they can couple all of that.

Once we start to increase the nutrient loading and the sediment loading in that environment, we push the bounds of that system, so other creatures now are selected to live in that environment. No matter what you do to help the corals grow, unless you can back out the water quality—and there are ways to do that—I think it is futile to restore the reef.

Senator SNOWE. Dr. Hunter, do you have any comments on that?

Dr. HUNTER. I concur with Dr. Dustan.

Senator SNOWE. Mr. Collins, yes.

Mr. COLLINS. I did not mention this earlier, but the reason I left the advisory council is Governor Bush appointed me to the governing board of the South Florida Water Management District. That board elected me chairman. The district currently spends something on the order of $400,000 a year in the Keys on storm water master plan development and water quality monitoring. We are getting ready to embark on a $400 million a year effort with the Federal Government, hopefully with the permission of Congress.

But I would tell you one thing, that should Congress decide that they are looking for a match in the Florida Keys I believe that the amount of money budgeted for the Florida Keys on behalf of the marine sanctuary—on behalf of the South Florida Water Management District, we would be willing to match a considerable amount of whatever you committed in match money.

Senator SNOWE. Let me ask you on the sanctuary program. From your perspective, both Dr. Connor and Mr. Collins, how do you think the agency should prioritize its responsibility with respect to implementing and updating the management plans? Right now, you have management plans, but they are not fully implemented, is that correct?

Mr. COLLINS. That is correct.

Senator SNOWE. For example, in the Florida Keys, what is the shortfall at this point? What is necessary to implement the management plan?

Mr. COLLINS. I am not entirely sure what the budget shortfall is in terms of dollars. I can tell you the areas where I believe it takes place are really in the critical areas—water quality, which is the one place where we can influence the coral reefs. Global warming falls a little bit outside of our individual influence.

But when you talk about water quality and anthropogenic influence, that is someplace where we can make a difference. I think the shortfalls there have hurt us. I believe very strongly that however many regulations we may pass, education and volunteer programs are really going to be the answer to that. So those shortfalls.

In Florida, remember, we have an individual sort of singular reauthorization problem. It has to be approved every 5 years by the Governor and the cabinet also, who are asking pretty much the same questions: What have we left undone and what do we need to do to try to solve that problem?

Senator SNOWE. Dr. Connor, I was looking at total funding amounts under the national marine sanctuaries. If $29 million were authorized, the Florida Keys Sanctuary would increase from $2.5 million to $5.8 million. Stellwagen would increase from $460,000 to $1,058,000.

Would that make a difference in planning? Would that cover it?

Dr. CONNOR. It is a really interesting question, and I think there is a philosophical problem. This is the only program—well, Coastal Zone Management Act to some extent—that NOAA vows that is really place-based, like EPA's watershed management programs. Instead of managing industry by industry, you are going and man-

aging for a place. This is the first time you have really managed an offshore area.

I think maybe some of the problem is the attempt to develop a management plan that is so comprehensive that you get everything in it. There is a recent evaluation of the program by NAPA, the National Association of Public Administration and one of their recommendations, which as a former place-based manager I really agree with, is: Look, let us set a few priorities in each of these sanctuaries, let us develop consensus around one or two issues, and then really push on them, and see how we go.

I think a step-by-step approach of priority setting is going to work. The other part that is really difficult in these sanctuaries is interacting between the sanctuary program and the other NOAA agencies, particularly NMFS. How do you work with the fisheries management council over closed areas on the fishing?

Senator SNOWE. Which you have at the Stellwagen, for example.

Dr. CONNOR. Georges Bank, Stellwagen is the same way.

That is why I liked what Mr. Collins said about the advisory board council process, to the extent that you can work some of these issues through advisory councils and experiment with some approaches, see how they work. I think what each of the sanctuaries needs to do, which is the same thing the estuary programs are going through, is develop two or three key goals for the next year and test them. Even more important than testing them, monitor them to figure out if they worked or not, because it is important to evaluate what management actions work.

We have a lot of fishery closed areas, but we really cannot tell how big the spinoff is and are they doing what we have intended.

Senator SNOWE. Well, could you answer the question, though——

Dr. CONNOR. With that money, yes, I think you could——

Senator SNOWE. No, I was going to ask you about something else. But you think that would be helpful, that part of it?

Dr. CONNOR. I think that would be sufficient. Ms. Yozell made a very clear case that you need some kind of base funding to be able to pull these programs off, and if you just have a manager and an educator like they have in Stellwagen Bank it's hard to do too much of anything. So you need some base staff to work that.

But then beyond that, I think I'd probably focus on making a few key management recommendations and going from there.

Senator SNOWE. What I was going to ask you is what I asked Ms. Yozell about implementation, whether or not it would make a difference in getting this kind of money for the implementation, as well as for the review process.

Mr. COLLINS. In the keys?

Senator SNOWE. Yes.

Mr. COLLINS. Yes. A large segment of what we tried to zone out in terms of avoiding user conflict and avoiding people impacts on natural resources has not been implemented because we do not have the money for the markers, we do not have the money for the buoys, we do not have the money for inshore areas, to mark off flats. We are just sort of starting to slowly creep into marking some of the more critical wildlife habitat areas that we have made no-motor zones.

So yes, I believe that would make a significant difference.

Senator SNOWE. I had asked you about the pressures placed on outer areas of the sanctuaries, the no-take zones for example. You have a number of them in the Keys. Does it place greater pressure on the fisheries?

Mr. COLLINS. That was one of the major concerns when we started. You know, you've got X number of people in the fishery. The commercial fishermen were convinced that it would. There is really not much of a sign yet that that is the case, and the reason for that is it is very hard when you have had a hurricane and a tropical storm go through the area and wipe out half of everybody's traps to get a feeling on that.

But the objective people that I know in the commercial industry have basically said—we are under a trap reduction program from the State anyway. They have not seen it yet. They are still concerned about it, but there is no evidence yet that that is the case.

Senator SNOWE. Now, the public process which you mentioned, which is key, having been through the public process myself on fisheries: Has the Federal response improved at all?

Mr. COLLINS. Massively.

Senator SNOWE. Massively, in response to what happened in development of the management plan?

Mr. COLLINS. It is a Pavlovian training. I mean, the amount of pain involved in having done it the wrong way convinced a lot of people that this is not how you do this. Also, it was a shock. It is very hard for Federal and State agencies—I run one now. I know exactly how a lot of them think.

But it is very hard for them to believe that average citizens, when you put them at a table in their aggregate, if you train them properly, are going to give you things that you would not figure out yourself. But they do. You know, the people that are out on the water every day have a perspective that is never going to be a scientist, but there is in it value.

If you take the time to teach them, people like myself, what it is that you are trying to accomplish, how it is you plan to accomplish it, you are going to get some things back that you will not get from anyone else. I believe that process, that advisory council process, is what we used on Everglades restoration.

I sat side by side with sugar farmers for 4 years drawing up that plan. We have been shooting at each other for 20. You learn things, I just believe very, very strongly. I believe that Federal and State agencies learn things from people that they would not get from their own employees.

Senator SNOWE. I agree. It is just because you have the experience. I went through that on the right whale issue, as I'm sure Dr. Connor remembers. We had a process where the Federal Government had handed down an edict on how to deal with right whales in the lobster industry. As you can imagine the original proposal would have been nothing short of catastrophic for the industry.

But when we had the public process it was very interesting. The lobstermen had creative and helpful ideas on how to best address the problem. They want to work, and work with the Federal Government. Who spends more time at sea than the lobstermen and the fishing industry?

It is now much more cooperative and productive working together, side by side, rather than this adversarial, contentious relationship. So I think that does happen when a mandate is handed down, those most affected have to live with it, rather than saying let us bring everybody in on the process, and let the solution percolate up into the system. Simply put, effective public participation makes much more sense. I think the Federal Government is finally learning that.

One final question for all of you in terms of our legislation on the coral reef and on the sanctuaries program. Can you give me any suggestions on any one issue that we should do in the legislation? What is the major priority?

Dr. DUSTAN. I think the major priority for the Florida Keys specifically is build a sewage system.

Senator Snowe: Ms. Cooper.

Ms. COOPER. I would say two things. One is a need for a set of criteria for resource managers to identify threats and to prioritize conservation actions to address those threats, because there is a whole variety out there. Water quality is the No. 1 threat in some areas, but ship groundings are the threat in others.

So I would make that available to the resource managers. The scientific community has an awful lot of information that has been accumulating and there needs to be some mechanism to now bring that together and make that available to society. Also through education. I think people need to understand the value of the resource, and as that happens I believe your job will be easier and ours will be, too.

Senator SNOWE. Thank you.

Mr. Collins.

Mr. COLLINS. Again, I said it once before, but I believe a citizens advisory council may be the strongest message I would send. The other one is I think it would help if in every sanctuary, as we did in the Keys, you identify the single largest threat to that sanctuary and set up a separate steering group made of State and Federal agency people and knowledgeable citizens in the area.

In the Keys it was water quality. Maybe it is ship grounding someplace else. But include the people at the State level that have responsibilities in that area with the people at the Federal level, and make them sit down and talk to each other on a regular basis. It produces surprising results.

Senator SNOWE. When we talk about improving water quality, what are we referring to specifically?

Mr. COLLINS. Water quality in the Keys, again anthropogenic sources that we can deal with, quantifiable, I agree. We are working very hard on water quality issues locally and with the State agencies. There is a massive waste water problem in the Keys. There is a storm water problem that is significant in the Keys.

We are working on master plans to try to get at both of them now. There is also an influence from the Everglades, Florida Bay and fresh water input. We produce fresh water inputs from the Central and Southern Project in quantities that fresh water by itself becomes a pollutant.

So we need a broad-based approach. It takes everybody that has responsibilities in those areas sitting in one room on a regular basis to get at it.

Senator SNOWE. What percentage of water quality problems could we prevent, as opposed to dealing with an issue like global warming?

Mr. COLLINS. We are researching that very extensively right now. There is a huge amount of—basically, all the money we can find getting poured into identifying that now. In inshore areas surrounding the keys, closed water systems, we can probably eliminate 90 percent of it. When you start talking about the reefs, though, there is a serious question about the source of that problem.

It would be easy if we could blame it all on ourselves and solve it right away. But as you get further to the west and as you strong out along the Keys, you are dealing with an influence that comes from the Mississippi River south. I am not sure we are going to do much on that. But what we do have to do is identify where we are impacting it, where we can spend money, and that is what they are in the process of doing in that water quality protection program.

Senator SNOWE. Dr. Connor.

Dr. CONNOR. On the marine sanctuaries reauthorization, I think the language is mostly codifying the program as we have understood how it is starting to work. So I think the issue is funding, funding, and funding.

Senator SNOWE. Dr. Hunter.

Dr. HUNTER. Back to the coral reef issues, although the statement is probably the same for both, education I think is the one direction that is missing from this legislation.

I would like to say that in the coral reef community, coral reef ecologists and resource managers, we have arrived at an enormous consensus over the last 5 or 6 years. What you keep hearing time and time again should not be construed as platitudes, but we have worked toward these common concerns about the threats and responses to threats that exist in the Atlantic, Caribbean, and the Pacific islands.

But as a part of that, I think we can go far through public education, through PSA's, such as you saw earlier about the Florida Keys.

Senator SNOWE. What information would you give on a public service announcement? What should the message be?

Dr. HUNTER. There are probably 20 messages that would be more effective than providing just one.

Senator SNOWE. Right. Isn't there a general message or concept that would be effective?

Dr. HUNTER. Right. Connecting the individual's action to what we see on the coast. For example, in Hawaii we have school kids, and public groups, who have a stencil that says: "Think about this. This is going to the sea." They put this picture of a fish and the words "Goes to the ocean" on storm drains and along gutters. It just brings public awareness up that big of a step.

Numerous messages like that, I think. Not just to the school kids. Goodness knows that they get a lot of this. It is their parents we want to bring back into the ballgame.

Senator SNOWE. Ship groundings, what percentage accounts for destruction of coral reefs through ship groundings or abandonment, whatever?

Dr. HUNTER. I think it goes back to what—well, it is different in the Pacific and the Atlantic again.

Dr. DUSTAN. It is very different. Many of the reefs in the Florida Keys are actually named after wrecks of ships: Molasses Reef, Carysfort Reef. A lot of them are named after wrecks.

What we are having now is continued small boats that are smashing these reefs, as well as even research vessels. The Columbus-Islan, the University of Miami, crashed onto Looe Key Reef and took out a couple of spurs. The Wellwood's radar went out one night and it crashed into an area on Molasses Reef and it looked like a McDonald's parking lot. It just graded the reef into thousands of square feet of flat rubble.

Many of those are navigational errors and there are some technology issues now. There are some little radar beacons that will warn global positioning systems. It would be possible since most people now use GPS systems or navigational systems. To install little warning devices and use high technology for that.

A lot of it is educating people. In some respects it boils down to putting a series of buoys around the reef and a chain.

Senator SNOWE. Why can we not mark these reefs? Do navigational maps show these reefs?

Dr. DUSTAN. You are absolutely right. But when you are out there anchored and somebody pulls up in an outboard that they have rented from the local dive concession and they look at you and they ask, "hey, man, where is the reef", it is apparent they do not have a clue.

What you will often see now in the Keys, is a series of buoys around all these reefs, If somebody starts to venture inside those buoys the people will actually start yelling and screaming at these boat operators. But for example, on Key Largo Dry Rocks there is a great big I-beam that marks the reef and it says "Danger, Exposed Rocks," or something like that. I have seen people drive their boats right up to the piling to read it.

Mr. COLLINS. It is true.

Dr. DUSTAN. Now, I do not know how. Maybe you need a boating license exam or something like that. Maybe you need some better education.

Senator SNOWE. I gather Mr. Collins agrees with you.

Dr. DUSTAN. Oh, yes.

Mr. COLLINS. In the original scoping hearings, the comments from the Florida Keys fishing guides were limited to two or three, mainly about water quality, but one of them was: Make a boating license and an education program leading up to one mandatory. We still believe that.

Senator SNOWE. Are coral reefs marked in the Keys at all?

Mr. COLLINS. Yes.

Senator SNOWE. They are?

Mr. COLLINS. They are marked. And just as the good doctor said, people will drive right up to them to see what the marker says. People ignore the markers. If you look at an aerial view of the standard markers used by the Coast Guard, they are covered on

both sides because people forget whether it is red on the right or red on the left, so they go as close to the marker as they can. So there are massive track marks around all of them.

Senator SNOWE. Well, what about this whole issue of criminal and civil penalties? Do you think that they would be a strong deterrent? We already have civil penalties today.

Mr. COLLINS. The concept behind civil versus criminal penalties was that for a criminal penalty you needed a witness situation involving the police officer, that was a lot more participatory on the part of the police officer. If it is a civil fine, you can just find a track leading down there with a boat out at the end of it, which is usually what we find, and basically that fine will hold up.

As has been pointed out, we are severely short of officers.

Senator SNOWE. Well, is it NMFS officers that do that, Coast Guard, or State agents?

Mr. COLLINS. They act—in the Keys, it is marine patrol officers, who are also sanctuary officers. The Key Sanctuary is run in partnership with Florida.

Senator SNOWE. They are one of the only sanctuaries that has that partnership, correct?

Mr. COLLINS. One of the only areas. But I would point out to you that I came to the Keys in 1974. There are currently fewer marine patrol officers in the Florida Keys than there were in 1974. We are working on that, but again if you do not have much enforcement it is hard to make a lot of the rest of the work, and that takes money.

Senator SNOWE. Dr. Hunter.

Dr. HUNTER. Well, human error is human error. The U.S. Marines ran into a patch reef in Kaneohe Bay on Monday, ran a landing craft hard aground on top of one of these reefs.

Senator SNOWE. That is not encouraging. I am chair of the Seapower Subcommittee.

Dr. HUNTER. It was a marked reef.

But as to the shipwrecks on the reef in Pago Harbor in American Samoa, there is another attribute to that. Yes, they are unsightly and yes, they are a hazard to the reef. They were driven up in an enormous hurricane and then abandoned because they were not producing any money after that, of course.

But I think for the local population to see those ships 7 and 8 and 9 years later works in direct opposition to what we are trying to accomplish. Why would you do your part to try to protect your coral reef resources when our government cannot help us get those boats off the reef and out of that harbor?

Senator SNOWE. Good point.

Well, I thank all of you for your excellent testimony and contributions here today, and we are going to take that into account as we develop the legislation on both coral reef conservation and reauthorization of the National Marine Sanctuaries Act. We are all hopefully going to work together on these goals. I think there is a strong commitment on this subcommittee.

This concludes our hearing. Before we leave, I ask unanimous consent that the hearing record remain open for 10 legislative days so that the Subcommittee may accept additional statements and questions from Senators, as well as any other information that the

subcommittee may want to include in the hearing record. Without objection, it is so ordered.

The hearing is adjourned, and again I thank all of you.

[Whereupon, at 4:53 p.m., the Subcommittee was adjourned.]

APPENDIX

PREPARED STATEMENT OF THE HON. BOB GRAHAM, U.S. SENATOR FROM FLORIDA

Senator Snowe, members of the Committee, thank you for the opportunity to comment on coral reefs and marine sanctuaries, environmental treasures that are very important to Florida. The witnesses at this hearing will present their perspectives on the importance of protecting our fragile coral reefs and marine resources. I would like to share with you the significance of these resources to the people of Florida, and especially the Florida Keys.

The Florida Keys are a 158 mile long string of islands at the southern tip of the Florida peninsula, with 85,000 year round inhabitants. Two and a half million tourists visit the Florida Keys each year, to fish, swim, snorkel, dive, and otherwise enjoy the beauty of these tropical islands and the surrounding waters. According to a 1996 study by the Monroe County Tourism Development Council, the National Oceanic and Atmospheric Administration, and The Nature Conservancy, almost one-third of visitors to the Keys go snorkeling or scuba diving, contributing $53 million a year into the local economy from reef and dive trips alone. An estimated 40% of the Keys' $1.15 billion in annual tourism revenues are reef related.

The popularity of the Keys is threatening the very characteristics that make them so desirable as a vacation destination. The reefs have been damaged by ship groundings, and the visibility of the formerly crystal clear waters is declining. I introduced legislation in 1990 to establish the Florida Keys National Marine Sanctuary and protect the marine habitat while continuing to allow commercial and sport fishing, diving, boating, and other activities that do not harm the environment when performed properly.

The sanctuary program has brought together representatives of federal, state, and local governments as well as environmental groups and other local interests to develop a plan for protection of the marine resources. Because 65 percent of the Florida Keys National Marine Sanctuary is in state waters, the state of Florida works in partnership with the federal government on sanctuary issues. Local residents were concerned that they would not have a role in decision making in the marine sanctuary. In fact, Monroe County residents voted 54.5% to 45.5% against the Florida Keys National Marine Sanctuary in 1996. Since then, sanctuary supporters have worked with local leaders to address the concerns of all stakeholders in the management plan. Currently, a working group representing the sanctuary, Dry Tortugas National Park, the state of Florida, and local business and environmental interests are studying the designation of 185 square nautical miles of the Gulf of Mexico around the Dry Torturgas for designation as an ecological reserve.

The Sanctuary's management plan states that water quality is the major factor affecting the health of the living coral reef, the sea grasses and fisheries stocks in the Florida Keys. If the water quality is not restored, the health of the coral reef resources will continue to deteriorate. Residents of the Keys currently depend on inadequate onsite sewage systems for waste disposal. These systems provide very little treatment, and allow waste to migrate rapidly to nearby waters. Recent studies have identified disease causing viruses in many of the canals along the Keys, and six Key West beaches are currently closed to fishing and swimming due to bacterial contamination from leaking sewer pipes. Planning is currently underway to improve the wastewater and stormwater infrastructure in the Keys, but continued federal assistance will be necessary to restore the water quality and protect the reef.

The coral reef legislation under consideration today provides much needed attention and support for protection of these valuable marine resources. However, both bills focus on the Department of Commerce and the National Oceanic Atmospheric Administration but do not provide support for the Department of Interior. Currently, the Department of Interior (DOI) protects significant coral reef resources in U.S., commonwealth and territorial waters. The National Park Service manages 9 park units and the Fish and Wildlife Service manages 19 wildlife refuges containing coral reefs, as shown on the attached figure from the Coral Reef Task Force web site (http://coralreef.er.usgs.gov/doi.pncr/figure1.html). Florida's Biscayne National

Park and Dry Tortugas National Park are the two largest NPS units with coral reef resources. By restricting the benefits of coral reef legislation to the Department of Commerce, we limit the effectiveness of the United States to protect all of these special areas.

The first National Park Service unit with coral reef resources was established in 1935 by presidential proclamation: Fort Jefferson National Monument, located on the Dry Tortugas at the westernmost end of the Florida Keys. In 1968, Congress established Biscayne National Monument, setting aside the northern most stretch of the greater Florida Keys reef tract. In 1980, Congress expanded and redesignated both Fort Jefferson and Biscayne as National Parks. These two South Florida parks along with the Florida Keys National Marine Sanctuary represent the largest contiguous subtropical coral reef ecosystem within the United States. It is important that any legislative proposal by the Senate reflect this ongoing partnership.

As you are aware, just over one year ago, President Clinton signed Executive Order 13089, emphasizing the need for a government-wide effort to protect and restore coral reefs in U.S., commonwealth and territorial waters. The Executive Order called for the creation of the Coral Reef Task Force, co-chaired by the Secretary of Interior and Secretary of Commerce. Secretary Babbitt took the lead in the development and implementation of the President's Coral Reef Task Force. The first summit of the Task Force was held in October 1998 at Biscayne National Park in South Florida. Just as this initial meeting stressed, any efforts, programs or legislation to support protection of coral reef resources within the U.S., commonwealth and territorial waters should include at a minimum both the Department of Interior and the Department of Commerce. Only through multiple agency support and partnership will our unique coral reef resources be protected. Providing the Departments of Interior and Commerce with the authority to leverage and fund a range of coral reef protection programs is an important first step.

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. MAX CLELAND TO SALLY YOZELL

Question. As you know, the Grays Reef National Marine Sanctuary off Sapelo Island, Georgia, is a precious resource to Georgia and the country. I applaud the partnership that NOAA has pursued with minority students at Savannah State University which has provided them with a unique opportunity to participate in marine research diving and education. I am not advocating a position at this time, but wanted to know if NOAA has any proposal in the works to make GRNMS a marine reserve, and if so, what would this mean?

Answer. Note: In responding to this question, NOAA is assuming that the term "marine reserve" refers to an area where no consumptive uses are permitted (i.e., no-take areas).

NOAA's Gray's Reef National Marine Sanctuary (GRNMS) will begin reviewing its Management Plan beginning this fall. During the review process, NOAA will examine the efficacy of all management practices, including the appropriateness of current boundaries and regulations. Scoping hearings will be held in late October or early November to receive the public's views on how the Sanctuary should be managed and emerging issues. Revising the management plan will be a community-based process involving the general public through roundtable discussions, public hearings, workshops, public comments and the Sanctuary Advisory Council. The Council is comprised of representatives from research, education, conservation, sport fishing and sport diving interests.

Currently, NOAA has no proposal to establish a marine reserve within GRNMS. However; this concept may arise during the scoping period for the management plan review process. If the concept of no-take areas arises, it will be evaluated along with all other management concepts. Should it appear that a no-take area is appropriate to effectively manage the resources of GRNMS, a proposal would be developed in coordination with relevant interests, the South Atlantic Fishery Management Council, and the community through public input.

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. JOHN F. KERRY TO SALLY YOZELL

Question. Earlier this year me New England Aquarium hosted a marine biodiversity workshop at which scientists identified the deepwater coral and sponge communities of George's Bank and the Gulf of Maine as top priority areas for protection. Few think of New England as home to important coral communities, yet fisherman in

the North Atlantic have stated that in the past they occasionally pulled up these huge underwater "trees" in their fishing nets.

(A) Could you elaborate on the status of these important coral communities and NOAA's efforts to protect them?

(B) What information does NOAA have regarding the role of deepwater coral communities in supporting fisheries?

(C) Is NOAA considering designating any areas with deep water corals as closed or marine protected areas?

Answer. A variety of deep water coral communities exist in U.S. waters of the Atlantic, Pacific, Caribbean and Gulf of Mexico. Until recently, relatively little was known about the location and role of these communities because they were difficult to identify, access and study. The advent of underwater video technology, more sophisticated sonars and other tools have allowed researchers to begin better study of these deep water coral communities. It is clear that these coral communities are important habitat for a number of fisheries and other species. There is also evidence that these relatively fragile coral structures are easily damaged by some activities. NOAA is currently conducting a review of the status of these important coral communities, efforts to protect and manage them (including any consideration of marine protected area designation), and their role in supporting fisheries. We expect this review to be completed by November 1st and will forward the findings to you at that time.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. OLYMPIA J. SNOWE TO SALLY YOZELL

Question 1. You testified that NOAA will spend $13 million in FY 99 on coastal zone management, coral reef mapping, water quality improvement, reef fishery management, education, research, and monitoring. You also stated that there is no current effort by NOAA for on-the-ground implementation of conservation efforts at the local level as called for by the U.S. Coral Reef Task Force's "Islands Initiative." The International Coral Reef Initiative has likewise identified the three areas of coastal zone management, research and monitoring, and local level implementation of coral reef conservation efforts as the most urgent coral reef conservation needs. Please explain why conservation efforts at the local level have not been targeted by the Administration, and whether such efforts should be a priority of any coral reef legislation?

Answer. In FY 1999 NOAA will spend approximately $13 million from base budgets of existing NOAA programs such as the Coastal Zone Management Program, National Marine Sanctuary Program, National Centers for Coastal Ocean Science, National Undersea Research Program, National Sea Grant Program, and the National Marine Fisheries Service on activities directly related to coral reefs. This funding currently supports a variety of on-the-ground actions to address coral reef issues at national, regional and local levels.

However, because the funding for these activities comes from base budgets of programs with responsibilities for a broad range of coastal issues in addition to coral reefs. Most NOAA funding for coral reef activities must be determined every year as one of many pressing coastal issues. Despite the tremendous economic, social, and biological value of coral reef resources and the significant threats they face, NOAA has litt1e funding permanently dedicated for activities to protect, restore and sustainably use coral reef ecosystems.

NOAA is committed to supporting additional local level actions as outlined in the U.S. Islands Coral Reef Initiative strategy. Additional support for local level efforts should be a priority of any coral reef legislation and we are pleased that both S. 725 and S. 1253 specifically include grant programs and authorization leve1s to provide additional support for local efforts to protect and sustainably use coral reef ecosystems.

NOAA led the 1999 proposal by the U.S. Coral Reef Task Force to make the U.S. Island strategy the top priority for any new funding available in FY 2000. Local level conservation efforts were specifically cultivated and funded by a joint NOAA and Department of the Interior initiative in FY 1998 and FY 1999 with limited available resources.

In the FY 2000 President's budget request, NOAA ($12 million) and the Department of the Interior ($5 million) requested a total of $17 million in new funding to support major portions of the U.S. Islands strategy and implement additional coral reef conservation measures at local, regional and national levels. To date, however, NOAA has received no new appropriations to support the additional local level actions outlined in the U.S. Islands strategy. The U.S. Islands strategy will be in-

cluded as a key part of the national action plan currently being developed by the U.S. Coral Reef Task Force. The draft national action plan will be presented at the next meeting of the Task Force, November 2-3, 1999.

Question 2. In 1997, as part of the International Year of the Reef, NOAA provided 20 coral reef conservation grants. Please provide for the record the following: (A) The amount of each of these projects? (B) How many of these projects are still underway today?

Answer. (A) In 1997, NOAA provided approximately $200,000 to the National Fish and Wildlife Foundation (NFWF) to support private-public partnerships for conservation of marine and coastal resources. Using these and other resources, NFWF helped fund 18 new coral reef projects from the Florida Keys to Palau in the western Pacific. While NFWF has provided some support for coral reef protects in the past, a new partnership with NOAA made it possible to expand support for coral reef projects. With additional funding from federal agencies, NFWF continues to offer a valuable opportunity to leverage federal funds to support local coral reef conservation efforts.

With the almost $200,000 in federal funds from NOAA, NFWF and the project grantees were able to generate over $150,000 in nonfederal funds and in-kind services for the 18 local-level coral reef conservation projects. Although there was no matching requirement for these projects, most projects provided some matching resources to leverage federal funds. The Office of Insular Affairs of the Department of the Interior also provided federal funding for additional local-level coral reef projects as part of this joint Year of the Reef effort. Federal funding for each project ranged from $5,000 to $50,000.

(B) These projects have all been completed. Most of the projects have made lasting contributions to local communities' efforts to protect and restore coral reefs. Since many of the projects were designed to produce educational materials on how to care for, monitor and protect coral reefs, these project materials continue to be used to inform school children, tourists, divers and residents.

Federal support from NOAA allowed local project sponsors to conduct a variety of activities including reseeding reefs with coral larvae in Guam; training conservation officers and producing educational materials on coral conservation in Palau; increasing the ability of local export officials in Indonesia to reduce illegal trade in protected corals; supporting the Great American Fish Count in US coral reefs; and supporting a number of education projects in Hawaii and other US coral reef areas to increase knowledge and awareness about coral reefs in schools, among tourists, and with the general public.

Brief project descriptions are provided on pages 24-33 in the 1997 NFWF Annual Report. Attached are two copies of the 1997 NFWF Annual Report for your reference. If you would like additional copies of the report, please contact NFWF.

Question 3. S. 725, The Coral Reef Conservation Act of 1999, contains a 50 percent matching requirement. This provision is intended to help local communities build the capacity necessary to raise funds for long-term sustainability. (A) Do you agree that it is important to build the capacity to help local projects achieve long-term sustainability? If so, please explain in detail. (B) Do you feel that grant applicants would be able to provide a 50 percent match, especially with the aid of a nonprofit organization to assist with fund raising?

Answer. (A) We think it is very important to help local communities build the capacity to support and implement projects that promote long-term sustainability. NOAA helps build local level capacity for coral reef conservation projects through a number of programs such as the Coastal Zone Management Program, the National Estuarine Research Reserve Program, and the Community-Based Restoration Program (National Marine Fisheries Service) In addition, NOAA continues to work with the National Fish and Wildlife Foundation to support community-based local-level conservation, education and restoration projects in coastal and marine environments. Helping communities acquire the tools, understanding and other resources to support local actions is critical to sustainable use of many coastal and marine resources.

(B) We believe that grant programs that require the applicant to provide some portion of the total funding as match are appropriate in some situations and have a number of benefits. Requiring applicants to provide matching resources (as funds or in-kind services) helps leverage federal funding and can increase involvement of community and other partners in the project. Many organizations use this type of matching requirement to encourage applicants to build partnerships among community, government and nongovernment entities. The projects resulting from these broader partnerships often have more involvement, support, applicability and lasting impact at the local level.

While some applicants may need assistance to secure matching resources, we believe most applicants would be able to provide 50% using funds or in-kind services. Having an organization available to assist grantees with finding match and building these partnerships is useful. However, there may be some groups who are unable to secure this level of match due to unique circumstances. Some flexibility is desirable to allow these groups to also be considered for possible support, and NOAA recognizes the flexibility that both S. 725 and S. 1253 provide.

Question 4. What percentage of U.S. Coral Reefs are within National Marine Sanctuary Boundaries?

Answer. Approximately 5% of all U.S. coral reefs fall within the boundaries of four National Marine Sanctuaries (NMS); Fagatele Bay NMS (American Samoa), Hawaiian Islands Humpback Whale NMS (Hawaii), Florida Keys NMS (Florida), and Flower Garden Banks NMS (Texas).

Question 5. What percentage of U.S. coral reefs are within state and territorial waters?

Answer. Approximately 35% of U.S. coral reefs are within state and territorial waters including those found in the U.S. Virgin Islands, Puerto Rico, Florida, American Samoa, Guam, Hawaii, and the Northern Mariana Islands.

Question 6. What percentage of U.S. coral reefs are within the areas covered by Coastal Zone Management (CZM) Programs?

Answer. Approximately 32% of U.S. coral reefs within state and territorial waters are within areas addressed by Coastal Zone Management Programs. Approximately 3% of U.S. coral reefs within territorial waters are not covered by the CZM Programs (in the U.S. territories such as Wake, Johnston, arid Baker Islands).

Question 7. What percentage of U.S. coral reefs are protected as part of Fishery Management Plans?

Answer.

Overview

Although comprehensive maps of all U.S. coral reefs do not exist, NOAA has recently estimated the total U.S. shallow-water coral reef area at nearly 17,000 square kilometers (NOAA's State of the Coast Report, 1998). About 65% of these reefs (approximately 11,000 km2—mostly in the Northwest Hawaiian Islands) are in federal waters of the EEZ and therefore under NMFS jurisdiction for fishery purposes. Overfishing and fishery impacts on habitat have been identified as major environmental problems on coral reefs worldwide. Therefore, Fishery Management Plans (FMPs) offer one important management tool for addressing fishery impacts in federal waters.

Only a small fraction of these reef areas in the EEZ are permanently protected from all fishing impacts (see "Additional protections offered through area closures" below). Nevertheless, FMPs offer a very wide and diverse variety of management measures affecting coral reef fishery species and their associated habitats. These measures usually address individual species, and may include gear limitations, seasonal area closures, size or catch limits, etc. that contribute to the protection of coral reef ecosystems. For this reason, it is not possible to estimate with any precision the percentage of reefs by number or by total area that is protected under provisions of FMPs.

The following provides a more qualitative discussion of protections provided under the Sustainable Fisheries Act and the Magnuson-Stevens Fishery Conservation and Management Act. Under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), the eight Regional Fishery Management Councils are responsible for preparing arid submitting for review all new FMPs, and amendments to existing FMPs. The National Marine Fisheries Service, for the Secretary of Commerce, reviews these submissions for consistency with the Magnuson-Stevens Act and all other applicable laws and implements them through Federal regulations.

Currently, five approved FMPs directly manage shallow reef corals or reef fish species and associated reef habitats in the Caribbean, Gulf of Mexico, and the South Atlantic regions. A sixth is nearing completion for the Western Pacific. Many other FMPs contain measures to manage fisheries for reef-associated fishes and invertebrates.

Under the provisions of the Sustainable Fisheries Act of 1996 (SFA), which made significant amendments to the Fishery Conservation and Management Act and renamed it the Magnuson-Stevens Act (Magnuson-Stevens Fishery Conservation and Management Act), the Councils must further amend all of their FMPs to add new

provisions, including those related to Essential Fish Habitat (EFH), bycatch, effects of fishing on habitat, and prevention of overfishing and rebuilding of overfished resources. Measures in place or under review to protect corals and associated fisheries are described below.

Protections Under the Provisions of the SFA Essential Fish Habitat Requirement

Four Councils (Western Pacific, Gulf of Mexico, South Atlantic, Caribbean) have identified the coral reefs within their areas of jurisdiction to be EFH. This means that these coral reefs have been determined by the Councils to be essential to some portion of the life of federally managed fisheries species. The Magnuson-Stevens Act also requires each Federal agency to consult with the Secretary of Commerce regarding any action (authorized, funded, undertaken, or proposed to be so) that may adversely affect EFH. In this consultation process, the Councils may comment on the impacts of such actions on EFH for their managed species. Under this consultation process, the Secretary is to recommend to the involved Federal agency any measures that can be taken by the agency to prevent adverse impacts on and to conserve the subject EFH. NMFS anticipates considerable input by all the Councils in advising on ways to conserve coral resources. (In this sense, 100% of U.S. coral reefs are "protected" under fishery management plans, although the level and effectiveness of protection will depend on the outcome of actual consultations).

Fishery Management Plans that Protect Coral Reefs and Coral Reef Habitats

Gulf of Mexico Fishery Management Council

Reef Fish—A moratorium and limited entry system for permits and restrictive quotas control fishing pressure on these stocks and on their coral reef habitat. Fish traps, roller trawls, and powerhead-equipped spear guns are prohibited in an inshore stressed area, also protecting coral reefs. Riley's Hump, a coral reef near Dry Tortugas, Florida, is closed to all fishing to protect mutton snapper spawning aggregations during May and June, as well as other reef resources. In March 1997, a 10-year phase out of the fish trap fishery was begun, in part to minimize impacts on coral resources.

Coral and Coral Reefs—Regulations implementing the FMP prohibit the harvest of stony corals, hydrocorals, black corals, and two species of octocorals, A permit system has been developed for live rock aquaculture to provide an alternative to wild live rock harvest, (Aquacultured live rock is considered an environmentally preferable alternative to continued harvest of wild live rock). Habitat Areas of Particular Concern (HAPCs) were established on the Florida Middle Grounds and the East and West Flower Garden Banks (off Texas). No bottom fishing gear that might damage coral resources are allowed in the HAPCs.

Shrimp Fishery—A cooperative Tortugas Shrimp Sanctuary has been established with the State of Florida to close a trawling area where small pink shrimp comprise most of the population. The closure also protects coral reefs and associated habitat. Turtle Excluder Devices (TEDs) are required in shrimp trawls to prevent sea turtle entanglement. In addition, bycatch of juvenile red snapper in shrimp trawls is a major problem in reef fish management. Regulations now require the use of Bycatch Reduction Devices (BRDs) in shrimp trawls.

Stone Crab Fishery—This fishery has more participants and stone crab traps than are necessary to harvest the optimum yield from the fishery. Since additional fishing effort could lead to increased conservation risks for the stock and habitat damages from the traps, Florida and the Council are developing a limited entry program for adoption in State and Federal waters off Florida.

South Atlantic Fishery Management Council

Snapper/Grouper Fishery—Most fish traps, entanglement nets, and longlines have been eliminated to address overfishing and habitat damage. To further prevent overfishing and overcapitalization, the Council has adopted limits on participation and fishing effort.

Shrimp Fishery—Regulations are in effect to limit the impact of the rock shrimp trawl fishery on essential bottom habitat; no trawling is allowed in the Oculina Bank Experimental Closed Area off east central Florida. To minimize adverse impacts on non-target marine resources, the Council has implemented a requirement for bycatch reduction devices (BRDs) in all shrimp trawls.

Coral, Coral Reefs, and Live/Hard Bottom Habitat—To protect ivory tree coral, *Oculina varicosa,* no fishing for snapper/grouper species and no anchoring of fishing vessels is allowed in the Oculina Bank Experimental Closed Area. Regulations im-

plementing the FMP prohibit the harvest of stony corals, hydrocorals, black corals, and two species of octocorals, but allow a limited harvest of certain other octocorals under quota for use in aquaria (a quota of 50,000 colonies per year is strictly enforced). Harvest of hard corals and live rock is prohibited; permits are available for the culture of live rock in Federal waters.

Golden Crab Fishery—This FMP is designed to prevent potential overfishing of this resource by limiting fishing effort (and to reduce any impacts on habitat, including coral reefs).

Joint Gulf of Mexico/South Atlantic Council FMPs

Spiny Lobster Fishery - A minimum size protects spawning potential, and gear restrictions are in place to protect female lobsters carrying eggs and reduce the amount of lost or "ghost" traps that may continue to fish for lobsters and finfish.

Caribbean Fishery Management Council

Spiny Lobster Fishery—This fishery is part of a multispecies trap fishery, which includes shallow-water reef fish. A minimum size was established for spiny lobster to protect spawning potential. Gear restrictions are in place to protect female lobsters carrying eggs and reduce the amount of lost or "ghost" traps that may continue to fish for lobsters and finfish.

Queen Conch Resources—The FMP includes 13 species of edible gastropods. The multispecies dive fishery also includes spiny lobsters, octopuses, and reef fish. To protect the queen conch resource, size limits, harvest limits, a closed season, and gear restrictions are in effect.

Reef Fish Fishery—Consisting of approximately 140 species, this fishery is managed primarily by seasonal area closures to protect spawning aggregations, and through gear restrictions. The Council is considering further gear restrictions and a trap reduction program. No harvest of Nassau grouper, jewfish, seahorses, or certain species of butterflyfish is allowed.

Corals and Reef Associated Plants and Invertebrates of Puerto Rico and the U.S. Virgin Islands—Harvest of hard corals, soft corals (octocorals), and live rock is prohibited. In addition to corals, the FMP covers live rock arid invertebrates associated with coral reefs in the U.S. Caribbean, as well as seagrasses and algae. Gear restrictions are placed on the taking of other invertebrates to protect coral reefs from physical and chemical damage. The FMP also includes seagrasses, which are essential fish habitat for a number of important commercial and recreational species, including queen conch. Also, the Council has submitted an amendment that would prohibit all fishing and all anchoring by fishing vessels to totally protect reef resources in a marine protected area off St. Thomas (Hind Bank).

Western Pacific Fishery Management Council

Bottomfish and Seamount Groundfish Fisheries—A limited entry system is in place for the Northwest Hawaiian Islands. Fishing is restricted to hook and line gear. Measures are in place to protect selected snappers and a small number of other reef fishes.

Crustaceans Fisheries—The fishery has two components: a limited entry fishery in the Northwest Hawaiian Islands, and a general fishery in the Main Hawaiian Islands and elsewhere in the Western Pacific. The allowed gear is lobster traps or hand harvest in Hawaii, with spearing allowed elsewhere in the Western Pacific. Closed areas protect habitat used by endangered monk seals and offer protection to habitat. The limited entry system and harvest guidelines place upper limits on the amount of fishing effort expended on lobster and associated damage to the habitat.

Precious Corals Fisheries—This FMP regulates fishing for precious corals occurring from 30-1,500 m. Fishing is allowed using either selective gear (hand or remotely operated vehicle) or nonselective gear (tangle nets). The regulations established one protected coral bed devoted to research only. The only area where precious coral fishing is currently being contemplated, Makapu'u bed off Hawaii, is restricted to selective gear only. The yield allowed from a bed harvested using nonselective gear is only one fifth of the yield allowed when selective gear is used. The Council is considering prohibiting the use of nonselective gear in all areas.

Coral Reef Ecosystem Management Plan (Under Development)—The Council is proposing to define "coral reef ecosystem" as those species, habitat, and other natural resources associated with benthic strata from 0 to 100 m.; "coral reef resources" would be defined as currently or potentially exploitable natural resources in coral reef ecosystems. The overall coral reef habitat under the jurisdiction of the Council is estimated to be 10,762 square km (less than 100 m depth). NMFS expects the completed plan to provide specific measures to protect coral reefs from adverse effects of fishing, including restrictions or prohibitions of particular gear, as deter-

mined to be practicable. The development team expects to submit the plan to the Council for review by the end of 1999.

Additional Protections Offered Through Area Closures

The Councils and NMFS are moving in the direction of using closed areas as a management tool for fishery management.

In the South Atlantic, Caribbean, and Gulf of Mexico regions there are several Habitat Areas of Particular Concern (HAPCs), areas that have been recognized as significant or critical to spawning, nursery, and feeding functions, or refuge. Additionally, there are many seasonal area closures (species specific).

South Atlantic Council

The Point off North Carolina, the Charleston Bump off South Carolina, and the Oculina Banks off the east coast of Florida are good examples of areas that are extremely productive in the SA that have been established as HAPCS. Only the Oculina HAPC has additional management measures to protect it. Furthermore, the recent South Atlantic Comprehensive EFH Amendment included a proposed rule to expand the area, in order to further protect (specifically from fishery-related impacts; i.e. scallop trawling/dredging) this delicate habitat area. There are 29 Special Management Zones (SMZs)—artificial reef areas—in the South Atlantic (mostly in SC) where commercial gear is prohibited (in most).

Caribbean Council

The Caribbean Council identified the Tourmaline Bank, Bajo de Cico, Abrir La Sierra Bank, and areas east of St. Croix and south of St. Thomas as areas significant to Red Hind spawning aggregations, and thus established area closures from Dec. 1—Feb. 28. There is also a mutton snapper spawning aggregation closure from March 1—June 30. Recently, the Council has proposed a "no-take" marine reserve off St. Thomas, USVI, to protect coral habitat and declining reef fish stocks. This proposal is under Secretarial review and is expected to be implemented later this year.

Gulf of Mexico Council

The Gulf of Mexico Council has established the Florida Middle Ground as an HAPC, prohibiting bottom longline, trawls, pots and traps, and dredges year-round. Furthermore, there are several seasonal closures for shrimp trawling. There is a spawning aggregation closure for Mutton Snapper and other species on Riley's Hump off the Dry Tortugas also.

The Gulf Council recently proposed the closure of a large area off the west central coast of Florida (about 422 square nautical miles) to all reef fish fishing to protect spawning aggregations of gag grouper, a species that is approaching an overfished condition. This live hard-bottom area, the Florida Middle Ground, contains extremely diverse coral communities, with unique floral and faunal assemblages. Thirteen species of octocorals and 15 species of scleractinian reef-building corals have been documented from this area.

Western Pacific Council

Longline fishing is prohibited in three areas to prevent conflicts between operators of longline, troll and handline vessels, and to prevent the incidental take of protected species: Year around closure in the EEZ around Guam, and seasonal closures around longline protected species zones in the Western Hawaiian islands and the Main Hawaiian Islands. Year-round and season closures to lobster fishing are used to provide a refuge for spawning lobsters and to protect the spawning biomass of lobsters. Fishing is prohibited the year-round in the Hancock Seamount fisheries to restore depleted groundfish stocks. Fishing for coral in the Westpac Precious Coral Bed is prohibited to preserve this coral bed as a natural area to be used for baseline studies and reproductive reserve.

Question 8. Given that reefs are predominantly found in State waters, would the Administration support the establishment of a partnership between the Federal government and State and local entities where each party pays a balanced share of the cost of conservation measures? Please explain in detail.

Answer. Current estimates indicate that only about one-third of all U.S. coral reefs are found in state or territorial waters (within 0 to 3 miles from shore) . However, these reefs may represent some of the most heavily utilized and impacted reefs within U.S. waters due to their proximity to increasing coastal populations and urban areas. With growing pressures on these reefs, it is critical to build partner-

ships among government and nongovernment entities at federal, state and local levels to implement effective actions for long-term conservation and sustainable use.

A number of partnerships among federal, state and local entities already exist and have begun to address coral reef conservation issues, but additional funding and other resources are needed to ensure long-term survival of near-shore reef resources. The Department of Commerce, the Department of the Interior and other federal agencies strongly support the use of existing partnerships with state end local entities for coral reef conservation, and the establishment of new Partnerships where appropriate.

As discussed in response to Question 3, NOAA believes that cost sharing among project partners is an important way to leverage resources and build support for conservation projects. NOAA supports the continuation and establishment of partnerships between the Federal government and State and local entities where each party pays a share of the cost of the conservation measures. The proportion of costs shared by federal, state or local entities, however, should be determined by a variety of factors and may not be the same for all projects

Question 9. NOAA has suggested that coral reef conservation legislation contain a provision enabling NOAA to provide technical assistance to State or Federal agencies with jurisdiction over coral reefs to further the goals of such legislation. (A) Does NOAA propose to use such funds to provide this technical assistance or would technical assistance be provided out of base program funds? (B) What amount is needed to cover the cost of proposed technical assistance?

Answer. (A) NOAA provides limited technical assistance for coral conservation and management to U.S. states and territories under base funds through programs such as the Coastal Zone Management Program, the Sea Grant Program, and the National Centers for Coastal and Ocean Science. However, given the scope and condition of coral resources in. the U.S., NOAA is requesting additional funding to be able to provide technical assistance more broadly to support national, state, and community based coral reef conservation programs.

(B) NOAA supports the authorization levels requested in S. 1253 which dedicate a percentage of the authorized funds for technical assistance. Full funding at the levels authorized in S. 1253 would provide much of the technical assistance needed to support the coral reef conservation programs at the national, state and community levels.

Question 10. (A) As a result of the U.S. Coral Reef Task Force, has NOAA noticed a greater degree of inter-agency cooperation and coordination in day-to-day coral reef activities? (B) Please describe the effect of the U.S. Coral Reef Task Force on NOAA's participation in international coral activities.

Answer. (A) NOAA has observed an increase in interagency cooperation and coordination in some activities related to coral reefs as a result of the U.S. Coral Reef Task Force. The Task Force is currently developing a National Action Plan for conservation and sustainable use of coral reefs which will help increase interagency coordination and participation in a wide range of areas. To date, the Task Force and its working groups have increased interagency cooperation and coordination in several areas including mapping of coral reefs in the Caribbean, establishment of new coral reef protected areas, and assessing the impacts of U.S. trade in coral reef species.

(B) The U.S. Coral Reef Task Force has supported NOAA's participation in international activities related to coral reefs. For example, NOAA has continued to develop new international partnerships for monitoring of coral reef bleaching and to report on the relationship between changes in ocean climate and coral reef health worldwide. The Task Force has helped increase NOAA's participation with other federal agencies in efforts to support coral reef conservation and sustainable use in other nations. NOAA is working with the Task Force to highlight the need to strengthen international collaboration and support for the global coral reef monitoring network as well as building capacity to manage coastal resources, and in particular, promote effective management of tropical marine protected areas.

Question 11. You stated in your testimony that you wish to work with the Committee on a provision that would fully address the problem of preventing and removing abandoned vessels that have been grounded on U.S. reefs.

(A) Please outline the scope of the problem, including an approximation of the number of vessels abandoned on U.S. reefs each year and the extent of the damage incurred by these vessels.

(B) Please provide for the record a list of examples where both U.S. and foreign-flag vessels have been grounded and abandoned on a reef. Please include instances

where the vessel owner has declared bankruptcy and subsequently operated additional vessels without paying for the damages incurred by the grounded vessel.

(C) Does the Administration support addressing these cases in coral reef legislation? If so, please explain what measures would be most effective and whether such measures would be a high priority for the Administration.

Answer. Grounded and abandoned ships can have significant impacts on coral reefs. Vessel groundings can cut large grooves in the reef, reduce parts of the reef to rubble, expose reefs to serious erosion and further damage, and change the distribution of fish and other coral reef species. Grounded vessels carry a wide variety of hazardous materials that can also cause serious damage if released from the vessel. And if grounded vessels or their wreckage is not removed they can continue to damage the coral reef and slow recovery as they are moved along the reef by waves and storms.

(A) NOAA, the National Park Service, the U.S. Coast Guard, the states of Hawaii and Florida, and the Commonwealth of Puerto Rico annually report a significant number of vessel groundings affecting coral reefs. For example, in the Florida Keys National Marine Sanctuary alone, over 250 vessel groundings on coral reefs are reported each year. Similarly, in Biscayne National Park, over 150 vessel groundings are reported annually. While groundings of commercial vessels are required to be reported and are usually recorded, there is no requirement for recreational vessels to report accidental groundings, unless they result in over $500 in damage. Consequently, the record of groundings on U.S. coral reefs is incomplete. NOAA is currently working with the U.S. Coast Guard and other agencies through the Administration's Coral Reef Task Force to identify the number of vessels that have been abandoned on U.S. coral reefs. To date the U.S. Coast Guard has identified 11 vessels abandoned on U.S. coral reefs since 1992 when the Coast Guard began keeping track of abandoned vessels following enactment of the Abandoned Barge Act. Of these grounding incidents on coral reefs, 9 resulted in the use of existing federal pollution funds (e.g., the Oil Spill Liability Trust Fund) to help with clean-up costs. In some of these cases, partial reimbursement was made for some of the clean-up costs.

(B) NOAA is involved with several coral reef restoration projects involving grounded and abandoned foreign-flag vessels. Examples include:

- The 1991 groundings of nine foreign-owned longline fishing vessels on the reefs in Pago Pago Harbor, American Samoa. The U.S. Coast Guard and Government of American Samoa have not been able to identify a viable responsible party to pay for vessel removal and natural resource restoration. Thus, the vessels have remained on the reefs, continuing to cause physical injuries.
- The October 1993 grounding of the Taiwanese longliner Jin Shiang Fa on Rose Atoll, a National Wildlife Refuge in the South Pacific. Salvage operations removed some of the larger pieces of wreckage and debris, but the salvage crew did not move the stern and its associated debris, or the engine block. Years after the event, the reef shows only limited recovery. This case was referred to the U.S. Department of Justice (DoJ) for recovery of oil spill response costs from the vessel owner. After an initial investigation, DoJ concluded that it would be very difficult to pursue a response recovery action under U.S. law and decided not to pursue legal action.
- The 1998 grounding of the M/V Paradise Queen II, a longline fishing vessel, on Kure Atoll in Hawaii. While the vessel insurer was able to pay for some salvage, the boat remains grounded on the reef. The vessel was considered a total loss by the marine insurer, and we are not aware of any plans by the owner to remove the vessel. Although S. 1253 does not have a definition of "abandoned," under general admiralty principles and Coast Guard policy directives, the vessel can probably be considered to be abandoned.

We are consulting with the Coast Guard on the instances where the vessel owner has declared bankruptcy and subsequently operated additional vessels without paying for the damages incurred by the grounded vessel. At this time it appears that the current system is unable to easily track grounded or abandoned vessels and subsequent bankruptcies and additional vessel licenses. Implementation of Section 8 of S. 1253 or other measures to address these issues may require changes to how agencies track and monitor these situations.

(C) The primary impediment to removing abandoned vessels that affect coral reefs is the lack of resources to fund the costs of salvage, which can be high, particularly when ships are in remote areas of the Pacific. A second impediment is the potential lack of a liability mechanism for Federal or State agencies to seek recovery of costs and damages when a ship runs aground in a non protected area (e.g. outside a Na-

tional Marine Sanctuary or National Park), is not an obstruction to navigation, or does not pose a threat of oil pollution or hazardous waste discharge. In cases where agencies do have authority to seek damages, there are instances where the vessel owner has declared bankruptcy or is otherwise unable to he identified. As stated in NOAA's testimony, we support the measures in S. 1253 and are prepared to work with the Committee on any additional provisions to more fully address these issues. As stated in part B above, it appears that the Coast Guard is currently unable to easily track grounded or abandoned vessels and subsequent bankruptcies and additional vessel licenses. Effective implementation of Section 8 of S. 1253 or other measures to address these issues may require changes as to how agencies track and monitor these situations.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. OLYMPIA J. SNOWE TO SALLY YOZELL

Question 1. Throughout the history of the Marine Sanctuaries Program, it appears that funding priorities have been largely focused on expansion efforts. The costs associated with the designation process and other expansion related efforts are substantial. Other than the Thunder Bay Sanctuary in Michigan, does NOAA intend to spend any money in fiscal years 2000-2004 on expanding the sanctuary system, including the development of a site selection protocol? Please explain.

Answer. With the completion of the Thunder Bay National Marine Sanctuary, NOAA has no plans for designation of new sites in the foreseeable future. At this time, the National Marine Sanctuary (NMS) program is focusing its resources on developing and improving the operational capacity of existing sites. This includes developing core staffing, better implementation of site specific management plans, including research, education and resource protection programs, and continuing the five-year management plan reviews. Therefore, given current and anticipated funding levels, NOAA is not planning to expand the sanctuary system in fiscal years 2000-2004. If NOAA receives the full Administration request for Sanctuary Program funding in FY00, we will begin development of a carefully considered, science-based process to work with coastal communities, states and other stakeholders to identify and evaluate potential sites.

Question 2. The Administration's bill focuses on the importance of ecosystem protection. However, none of the Administration's suggested changes highlight the importance of compatible commercial uses, such as fishing in marine sanctuaries. Please explain in detail how the Administration's bill enhances the goal of balancing compatible uses with resource protection.

Answer. The primary purpose of the National Marine Sanctuary Act (NMSA) is resource protection and NOAA's priority is to achieve this mandate. However, the NMSA also provides that uses that are compatible with the primary purpose of the NMSA should be allowed within sanctuaries. The Administration's bill does not change the goal of allowing all public and private uses compatible with resource protection, but supports and clarifies the resource protection mandate and the focus on ecosystem management. The clarification will help improve sanctuary management and provide clearer guidance on assessing whether uses are compatible with resource protection. The resulting emphasis on ecosystem protection also acknowledges the Administration's position, articulated at the National Ocean Conference, to further the nation's marine ecosystem protection efforts and the worldwide focus on oceans following the United Nation's designation of the "Year of the Ocean."

During the designation process for a site, activities that are harmful to sanctuary resources are identified and regulations are developed in a public process, as appropriate, to prohibit or restrict a narrow range of activities to protect sanctuary resources. Even these restricted activities may be conducted under the conditions of a sanctuary permit. There are many compatible uses that are currently allowed within National Marine Sanctuaries, including: swimming, SCUBA diving, boating, commercial and recreational fishing, and research activities.

Question 3. Around the nation, NOAA has not made clear to the public the purpose of marine sanctuaries. Because of this, some people have raised concerns that marine sanctuaries are established solely for the purpose of resource protection. Please explain in detail the role that the proposed educational facilities will play in improving the general understanding of compatible uses in marine sanctuaries.

Answer. Due to the remote location of many of NOAA's National Marine Sanctuaries (NMS), easily accessible interpretive facilities are needed to educate the public about the importance of the marine environment and these special protected

areas. NOAA's proposed interpretive facilities for NMS will be designed to educate the public on the understanding and protection of marine resources and biodiversity and the unique role of NMS. Through education NOAA hopes to make the public better stewards of our nation's precious marine resources. An important component of the full understanding of the marine environment is an understanding of how human uses affect the marine environment and how they can be compatible with resource protection. By educating the public on the effects of different activities, NOAA hopes to inform the public on how individual activities may affect the marine environment and how they can change their own behavior to become better stewards. In addition, we hope to educate the public on the role of NMS and how NOAA manages multiple uses, through regulations, zoning, and permitting to allow many uses and ensure their compatibility with the primary mandate of resource protection. Through these education initiatives at strategically placed interpretive centers, NOAA will educate the public on the importance of their local marine sanctuaries and the preservation of the marine environment.

Question 4. Enforcement in marine sanctuaries appears to be a nation-wide problem. In many sanctuaries, the employees do not enforce the National Marine Sanctuaries Act. Rather, enforcement responsibilities are conducted through partnerships with authorized officers of the state marine patrols and enforcement personnel at the National Marine Fisheries Service. (A) How much money does the Administration propose to spend on enforcement of the National Marine Sanctuaries Act in FY 2000?

Answer: There are more people using the sanctuaries than ever before. With the increased demands to protect these valuable sanctuary resources, there are now insufficient funds available for NOAA or its enforcement partners to enforce effectively the NMSA and its implementing regulations Therefore, enforcement is an important program objective for the Marine Sanctuaries Division in FY 2000. A total dollar figure is being developed, as the individual sanctuary field sites are currently developing their annual operating plans and site budgets, which will address this priority objective. During FY 1999, the site budgets dedicated exclusively to enforcement ranged from $0 to $500,000, with a total system expenditure of $586,000. These costs are for specific needs, such as paying for Florida Marine Patrol staff ($500K) or installing radar on a local Navy tower in Gray's Reef ($10K). The proposed spending only includes the funds expended by the NMS system itself and does not include the contributions made by our partners in enforcement. Most of the enforcement costs at individual sanctuary sites are staff time, which is not specifically tracked or accounted, but is significant. In addition, NOAA contributes staff time to enforcement at headquarters, as well as staff hours within the NOAA Office for Law Enforcement and the NOAA Office of General Counsel for Enforcement and Litigation (GCEL). Although not specifically tracked, it is estimated that in FY 1999 this staff time was worth more than $500,000. (See also the response to question 4(B) below.)

Question 4. (B) In the Administration's FY 2000 budget request, the Administration proposes a $12 million increase in the National Marine Sanctuaries budget. Is any of the $12 million increase dedicated to enforcement, including the development and implementation of enforcement partnerships? If so, how much?

Answer: As discussed in the answer to question 4 (C), NOAA has many partnerships it uses to conduct enforcement activities. If the Congress funds the full amount of the Administration's proposed budget for National Marine Sanctuaries, the Marine Sanctuaries Division (MSD) has planned to augment these partnerships by dedicating up to $400,000 to a pilot project with the NOAA Office for Law Enforcement (OLE). This will fund NOAA uniformed officers and/or special agents dedicated solely to sanctuary enforcement at one or two sites. The pilot effort will establish a process for effectively using NOAA enforcement personnel to enforce sanctuary regulations in the future. MSD and OLE have recently begun work to develop a multiyear enforcement strategy for the Sanctuary Program, which will incorporate this pilot effort, and identity enforcement needs, priorities, approaches and funding requirements. In addition, individual sanctuary sites may boost the amount of their site budgets dedicated to enforcement (see response to question 4(A)).

Question 4. (C) As you know, NMFS personnel are responsible for enforcing the Magnuson-Stevens Fisheries Conservation and Management Act, the Marine Mammal Protection Act and other laws administered by NMFS. According to NMFS, 171 enforcement officers are employed by NMFS. It seems unlikely that NMFS personnel have the ability to make a real difference in the enforcement of marine sanctuaries regulations. In addition, partnerships between the states and marine sanctuaries only exist in two instances. Please explain in detail who is conducting en-

forcement activities at each of the sanctuaries, plans at each site to enhance current enforcement activities, and unmet enforcement needs at each sanctuary.

Answer. National Marine Sanctuary Program personnel are not authorized enforcement officers. The program relies upon the NOAA Office for Law Enforcement (OLE), the official enforcement arm of NOAA, for sanctuary enforcement. OLE is responsible for enforcement of the National Marine Sanctuaries Act (NMSA), as well as the Magnuson-Stevens Fishery Conservation and Management Act, Marine Mammal Protection Act, and other laws administered by NOAA. However, OLE receives no direct appropriation to support NMSA enforcement as it does for these other NOAA statutes. At its current funding and staffing levels, OLE can only provide limited support to the sanctuaries. Therefore, where appropriate, each of the sites has developed partnerships with the Coast Guard, other Federal enforcement agencies, and/or with the states, through memoranda of agreement and. cross-deputization with NOAA. As one of our principle enforcement partners, the Coast Guard dedicates cutter, aircraft, and small boat hours as able to marine sanctuary enforcement. Below is a table of the enforcement partnerships and an initial needs assessment for each individual site. As discussed in the response to question 4(B), MSD and OLE are developing a multi-year strategy for enhancing enforcement efforts for the Program.

NATIONAL MARINE SANCTUARY ENFORCEMENT

Sanctuary Site	Partners	Enforcement Needs/Issues
Stellwagen Bank, MA	Coast Guard/ CG Aux.	seasonal site use, linked to other NOAA responsibilities: marine mammals, trash/boat debris
Monitor, NC	Coast Guard w/ routine patrols	fishing gear damage, looting; remote location
Gray's Reef, GA	Coast Guard, CG Aux. w/ overflights; radar on Navy tower	seasonal site use, linked to overall NOAA fisheries issues/responsibilities
Florida Keys	Coast Guard, Florida Marine Patrol	heavily used site, numerous groundings; also poaching, Area to Be Avoided, idle speed only, marine life collecting
Flower Garden Banks, TX/LA	Coast Guard (routine overflights & emergency response)	remote location; anchoring on coral, fishing gear damage
Channel Islands, CA	Coast Guard & CA Fish & Game.	discharge & boating disturbance, overflights; undetermined level of violations
Monterey Bay, CA	Coast Guard & CA Fish & Game, CA Parks as avail.	overflight zones, seabed alteration, discharge, personal watercraft, marine mammal & seabird disturbance; undetermined level of violations
Gulf of Farallones and Cordell Bank	CA Coast Guard, CA Fish & Game	overflights, discharges, jet skis
Olympic Coast, WA	Coast Guard, National Park Service (DOI)	site use low, remote location; shipping, fishing, recreational activity, subsistence Native American activities

NATIONAL MARINE SANCTUARY ENFORCEMENT—Continued

Sanctuary Site	Partners	Enforcement Needs/Issues
Hawaiian Islands Humpback Whale	Coast Guard and Navy (through OLE)	whale approach, linked to other NOAA responsibilities: marine mammals; seasonal but need year-round presence for outreach/education
Fagatele Bay, American Samoa	Dept. of Marine & Wildlife Resources	undetermined level of violations, nighttime spearfishing, dynamite fishing

Question 5. The Administration's bill would create new criminal penalties for interfering with the enforcement of the National Marine Sanctuaries Act and allow authorized officers to arrest persons who commit such prohibited acts. This is a significant expansion of enforcement authority under the National Marine Sanctuaries Act. Please explain in detail how creating new criminal sanctions will affect the enforcement problems that currently exist in marine sanctuaries.

Answer. The Administration's bill addresses shortcomings in the current NMSA, thereby improving NOAA's ability to enforce the NMSA and it's implementing regulations. The addition of criminal sanctions extends only to interference with law enforcement, leaving the majority of prohibitions to be handled by the appropriate civil penalty system. The agency has learned through experience that there is a need to have criminal sanctions to adequately address the types of acts which might be carried out against our employees and cooperating agency staff in the course of their investigative efforts. As with any law enforcement efforts, in the course of conducting investigations under the NMSA, authorized officers may be seriously interfered with, threatened or assaulted.

Criminal sanctions for interference with law enforcement are contained in the other statutes that NOAA enforces (Magnuson-Stevens Fishery Conservation and Management Act, Marine Mammal Protection Act, Endangered Species Act). The absence of such sanctions in the NMSA stands out among all the statutes under NOAA's authority for failing to provide such protections to our emp1oyees without an apparent justification for doing so. By bringing the NMSA into conformity with the other statutes that NOAA enforces, NOAA enforcement agents are always working under the same guidelines.

June 30, 1999

Chair Snowe and Distinguished Committee Members

This testimony was prepared by Dave Raney, a volunteer member of the Sierra Club's National Marine Wildlife and Habitat Committee. Mr. Raney, a resident of Hawaii, heads the Club's Coral Reef Working Group. He was also appointed by the Secretaries of the Interior and Commerce to serve as the Pacific Non-Government Organization Representative to the United States Coral Reef Task Force:

Thank you for the opportunity to present our ideas on this bill, which we support. We note that this bill contains similar provisions to S. 725, which we also support. In comparing the two bills, we find that S. 1253 contains additional provisions, with a commensurate higher level of funding, which we consider necessary to adequately support the wide range of activities required to fulfill the mandate of the U.S. Coral Reef Task Force.

The U.S. Coral Reef Initiative, begun several years ago, and the U.S. Coral Reef Task Force created last year under Executive Order 13089, have raised awareness of the precarious state of coral reefs globally, and within U.S. jurisdictions, and have stimulated the creation of local coral reef intitiatives. From the beginning, a "bottoms up" approach to coral reef initiatives has been encouraged by the federal agencies. Up to now, however, relatively little funding for coral reef conservation has gone to community or non-governmental organizations actually operating at the grassroots level. Also, recent actions by the Senate appear to have eliminated much of the funding required by NOAA for projects directly related to coral reefs. S. 1253 would restore such funding.

Both bills recognize the importance of supporting community-based coral reef conservation projects, and provide mechanisms for doing so. We especially appreciate

provisions tor waiving matching requirements for small projects (under $25,000), and for recognizing in-kind services and other noncash support to help meet matching requirements. We note that S. 1253 allows for a matching level of federal funds not to exceed 75% of the total project costs, as opposed to a maximum of 50% in S. 725, We would prefer the higher federal match of S. 1253, noting that community groups usually have more enthusiasm than cash.

We agree with the findings in Section 2 (10) of this bill, which state the desirability of legislation solely dedicated to the comprehensive and coordinated conservation, management protection and restoration of coral reefs and coral reef ecosystems, incorporating Executive Order 13089. House Concurrent Resolution 8, and the relevant federal, state, and territorial programs. We also find the Policy Section to be a valuable provision.

Sections 8 and 9 of the bill appear to address concerns raised by Hawaii and American Samoa over the problem of abandoned vessels, specifically including the nine vessels in Pago Pago harbor which have been an eyesore and environmental problem for years. It is heartening to see this kind of specitic action in response to needs which have been expressed by the states and territories.

In conclusion, we greatly appreciate the concern for coral reef conservation and protection, and support for community-based coral reef conservation projects, which bills S. 1253 and S. 725 address. We would like to see the good features of both bills adopted, including the comprehensive measures and funding levels of S. 1253.

Thank you.

Sincerely

Dave Raney

PREPARED STATEMENT OF STEPHEN COLWELL, EXECUTIVE DIRECTOR OF THE CORAL REEF ALLIANCE (CORAL), DIRECTOR OF THE INTERNATIONAL CORAL REEF ACTION NETWORK (ICRAN) PUBLIC AWARENESS PROGRAM, AND MEMBER OF THE INTERNATIONAL CORAL REEF INITIATIVE (ICRI) COORDINATING AND PLANNING COMMITTEE

Chair Snowe and Distinguished Committee Members:

Thank you for the opportunity to present our ideas on S. 1253, which we strongly support. The Coral Reef Alliance (CORAL) is a member-supported, non-profit that works with divers, snorkelers and the dive-tourism industry to promote coral reef conservation. This is a much larger and more widespread constituency than you might imagine. There are over 6 million certified SCUBA divers and over 35 million snorkelers in the U.S. from all 50 states. What is the #1 vacation destination for these divers and snorkelers? Coral reefs. Reported annual dive-tourism industry receipts related to coral reef tourism (including equipment, services and travel) approach $2 billion annually. The dive-tourism industry also employs tens of thousands of workers—many of whom live thousands of miles from the nearest coral reef.

Therefore, coral reef conservation is not just an "environmental" issue, it is an important business issue. Leaders of the dive-tourism industry now recognize that a healthy industry depends on healthy coral reefs. The Dive Equipment and Marketing Association (DEMA)—the dive industry's trade organization—has recently added environmental conservation as part of their industrywide platform for growing the dive industry.

Given the economic impact of the dive-tourism, the investment in coral reef conservation represented by S. 1253, would make good business sense even if coral reefs did not have such an important role to play in maintaining marine biological diversity, providing recreational and commercial fishing, and protecting shorelines from excessive wave action and flooding.

Years of experience in coral reef conservation has demonstrated that effective conservation comes only with effective partnership among many stakeholders. Government and non-governmental organizations each have important roles to play. S. 1253 recognizes the need for this partnership and provides the full funding NOAA needs to carry out its role, while simultaneously creating a source of funds for the community-based coral reef conservation projects, public awareness campaigns and other smaller conservation initiatives that have proven to be effective and cost-efficient.

In conclusion, we strongly support the commitment to coral reef conservation and protection represented by S. 1253. CORAL also supports S. 725, but the higher level of funding represented by S. 1253 does promise more comprehensive protection. Recent reports (see e.g., the World Resources Institute's Reef at Risk Report and the

Conclusions of the 1999 National Coral Reef Institute Conference) dramatically demonstrate the need for speedy action if we are to be able to reverse the tide of destruction facing coral reefs. S. 1253 and S. 725 provide proof of the commitment of the United States to coral reefs and to the millions of U.S. citizens that depend upon healthy coral reefs for their employment, income and recreation.

Thank you for your attention.

Sincerely,

Stephen Colwell

Executive Director

CORAL -The Coral Reef Alliance

June 25, 1999

JOINT PREPARED STATEMENT FROM THE CENTER FOR MARINE CONSERVATION, THE MARINE CONSERVATION BIOLOGY INSTITUTE, AMERICAN OCEANS CAMPAIGN, THE ENVIRONMENTAL DEFENSE FUND AND WORLD WILLIFE FUND, ON NATIONAL MARINE SANCTUARIES AND CORAL REEFS

Madam Chairwoman, and Members of the Subcommittee, the Center for Marine Conservation (CMC), the Marine Conservation Biology Institute (MCBI), American Oceans Campaign (AOC), the Environmental Defense Fund (EDF) and World Wildlife Fund (WWF) are providing this statement to be inserted into the June 30, 1999, hearing record on National Marine Sanctuaries and Coral Reefs. We would like to take the opportunity to thank the Chairwoman and Members of the Subcommittee for their work on these very important issues.

We commend the sponsors of the Coral Reef Conservation Act of 1999 (S. 725) and the Coral Reef Protection Act of 1999 (S. 1253). It is becoming increasingly clear that our oceans and coastal areas contain irreplaceable resources that benefit all of us. Although increased attention has been given to the oceans vast resources over the last several years, more needs to be done. S. 725 and S. 1253 both provide important opportunities to conserve and protect coral reefs. We look forward to similar bipartisan support for reauthorization of the National Marine Sanctuary Act.

Our organizations share the desire to see the National Marines Sanctuary Act reauthorized this Congress and to have additional conservation efforts directed at coral reefs. Our testimony will cover coral reefs and sanctuaries generally and then the Senate legislation dealing with these issues.

MARINE SANCTUARIES

OVERVIEW

Established in 1972, the National Marine Sanctuary Program provides one of the best tools for protecting and preserving marine resources in special areas of our ocean and coastal waters. The Sanctuary Program encompasses more than 18,000 square miles and includes 12 sites stretching from New England to the Hawaiian Islands and beyond. Twenty seven years after the creation of the National Marine Sanctuary Program, we believe that, while it has achieved considerable success, it has not lived up to its enormous potential or fulfilled its mandate to protect and restore special marine areas.

In establishing the National Marine Sanctuary Program, Congress created a tremendous program with great potential for conserving and protecting this Nation's outstanding marine resources. Our organizations remain committed to seeing the program reach that potential and believe that there is now an unprecedented opportunity to make it happen. The five prior reauthorizations have helped strengthen and solidify the statute and we do not believe that major modifications are necessary during this reauthorization. However, we believe some fine-tuning could assist the program in reaching its potential, and feel strongly that adequate funding is essential for improving the program.

FUNDING LEVELS

The biggest obstacle to the National Marine Sanctuary Program achieving its legislative mandate has been an inadequate level of funding. Almost ten years ago, an independent, external review panel convened by the Bush Administration endorsed a funding level of $30 million as the minimum required to fund the Program at that time. Yet in 1999, the National Marine Sanctuary Program achieved less than half of that funding or less than $1,000 for each square mile of sanctuary, despite the

addition of six sanctuaries since 1990. Inadequate funding has resulted in a program that is understaffed, limiting conservation, educational and research opportunities. In addition, NOAA has fallen behind on the reviews of sanctuary management plans. Although NOAA is now moving forward on management plan reviews for the Stellwagen Bank, Channel Islands and Gray's Reef National Marine Sanctuary, many other plans were developed over 20 years ago and have not yet been reviewed. These reviews are necessary to address new and changing conservation issues such as fishing and water quality concerns.

The Administration has requested $29 million for FY 2000 and our organizations believe that Congress should, at a minimum, fund the program at that level, in addition, we recommend that in out years Congress provide increases of $5 million per year starting in FY 2001. Previously, inadequate funding has resulted in a program that is both understaffed and capable of sustaining only a small fraction of priority activities. No existing sanctuary has an adequate interpretive facility or research and monitoring program. NOAA has yet to complete a single sanctuary management plan reviews.

The $29 million proposed for FY 2000 funding includes $26M for operations that would be adequate to provide core staffing, support basic programs for the existing sanctuaries and continue some management plan reviews; and $3 million to initiate limited visitor/interpretive center projects and develop a more comprehensive facilities plan. Additional out year funding increases are necessary to ensure that NOAA can meet the legislative mandates of the program; develop more than basic programs; complete its management plan reviews; implement a comprehensive facilities plan, including development of interpretive centers that benefit local communities; and continue to improve the NMSP. We propose the following authorization levels for the NMSA:

FISCAL YEAR	PROG. OPERATIONS	CONSTRUCTION	TOTAL
FY2000	$26M	$3M	$29M
FY2001	$29M	$5M	$34M
FY2002	$32M	$7M	$39M
FY2003	$35M	$9M	$44M
FY2004	$39M	$10M	$49M

These modest increases will allow for a steady strengthening of the NMSP and help prevent stagnation.

PROGRAM MANDATE

The existing National Marine Sanctuaries Act offers a comprehensive approach to the conservation of special marine areas, ranging from the coral reefs of Florida to the kelp forests of the California coast. Since its inception and though five authorizations, Congress has recognized comprehensive "resource protection" as the primary objective of the NMSP. However, these same reauthorizations have left this primary mandate obscurely stated in the statute. We recommend that existing statutory language contained in the Findings, Purposes and Policies section be consolidated to clearly state that "the purposes and policies of this title are to create a system of national marine sanctuaries that provide a comprehensive approach to the conservation of special marine areas with the primary objective of resource protection."

COORDINATION WITH FISHERY MANAGEMENT COUNCILS

Furthermore, we agree with the National Research Council that fishing and related extractive activities are one of the primary human activities affecting marine ecosystems, including those contained within marine sanctuaries. The existing statutory language that provides the Regional Fishery Management Councils and the Secretary of Commerce with roles in developing and evaluating such regulations recognizes the need, in some cases, for sanctuary-specific fishing regulations. While we do not view the current language as ideal, we recognize that many different viewpoints went into developing this language. We believe it represents a workable compromise that can lead to the development of appropriate sanctuary fishing regulations that protect sanctuary resources. The following steps would greatly enhance the likelihood of success in the process: requiring that the Secretary of Commerce formally request the Council's input as early as possible in a Sanctuary designation or management review process; providing a specific time frame within which the Council is required to respond to this request; and requiring a finding by the Secretary on the adequacy of the Council's response.

MARINE ZONING

Marine zoning is a recent and innovative tool used to conserve marine resources throughout the world that is receiving considerable scientific attention and acclaim. Marine zoning focuses on preserving and restoring intact portions of the world's oceans to ensure their overall health and integrity while allowing compatible uses. Several sanctuaries, including the Florida Keys. are already incorporating this creative conservation tool in their management plans. The authority to use this tool already clearly exists. However, we recommend that during reauthorization, language be added to ensure that innovative management tools, such as marine zoning, are considered in the development and review of sanctuary management plans and applied where beneficial.

FIVE YEAR MANAGEMENT REVIEW PROCESS

The five year management review process is a critical component of the National Marine Sanctuaries Act. Unfortunately, none of the sanctuary management plans, some of which are more than 20 years old, have been revised to incorporate new issues, new scientific information or new management techniques. The public, stakeholders and local communities deserve a periodic review of each sanctuary management plan to make sure that it is up-to-date, relevant to current issues, and fulfilling its purpose.

NEW SANCTUARIES

Given the significant challenges and limited resources existing sanctuaries face and the need of these sanctuaries to fund and implement basic activities, such as staffing and review of existing management plans, we believe the Program's priority should be on meeting the needs of the current sites. However, as we approach a new millennium, we also believe that the National Marine Sanctuary Program should be looking to the future as well. While the short-term focus should be on current sites, the program should not be prohibited from exploring, and when necessary, recommending additional sites.

CORAL REEFS

Coral reefs are the most diverse marine ecosystem in the world. Although they cover only one percent of the entire area of the oceans, they have been dubbed the "rainforests of the sea" because of the great variety of marine species that they support. Coral reefs are home to roughly one-third of the known marine fish diversity and thousands of other species. In the United States, more than 6,500 square miles of the Atlantic and Pacific Oceans contain coral reefs. Not only are reefs biologically valuable, they also have great economic and aesthetic values including fisheries, diving and tourism.

Unfortunately, the health and quality of coral and coral reef environments has been in decline over the past several decades. In recent years coral reefs around the world have suffered significant damage. Major anthropogenic stressors include over exploitation of the living components of reef ecosystems, pollution and global warming. Diseases also pose a threat to coral reefs, especially those already affected by human disturbance.

Fortunately, however, a great deal of attention is being focused on the plight of coral reefs in the past few years. The United Nations declared 1997 the International Year of the Reef and an international plan to conserve corals was developed, but has not yet been implemented. In 1998. the United Nations Year of the Oceans, the Clinton Administration issued Executive Order 13089, for the Protection of Coral Reefs. E.O. 13089 requires federal agencies to use their existing authorities to conserve and protect coral reefs and established the Coral Reef Task Force. The Task Force has met twice since its creation. The Task Force is working on several important issues including mapping, protected areas, water quality and global warming.

At the second meeting of the Task Force, the Center for Marine Conservation hosted a workshop on the human impacts on coral reefs. The workshop was cosponsored by the Environmental Protection Agency, the Department of Land and Natural Resources of the State of Hawaii, the Department of the Interior and the Department of Commerce. At the workshop, coral reef ecologists agreed that while there was much left to learn about coral reef biology, enough is already known to indicate that stronger protection measures are needed. They agreed that these systems are not well protected, making them vulnerable to large scale commercial exploitation. Recommendations were made that significant areas of coral reef ecosystems be set aside and protected from all extractive activities. CMC is planning

to host another workshop that will coincide with the Task Force's next meeting this fall.

S. 725 AND S. 1253

Our organizations would like to express our appreciation and recognize the leadership of the Members of the Subcommittee in developing measures to improve the protections provided to coral reefs. Both the Coral Reef Conservation Act of 1999 (S. 725) introduced by Senator Snowe and the Coral Reef Protection Act of 1999 (S. 1253) introduced by Senator Inouye represent positive steps forward in addressing the need to protect and conserve coral reefs. These two pieces of legislation represent a good framework for developing stronger and more comprehensive coral reef legislation.

Both S. 725 and S. 1253 provide critically need new financial resources to conserve and protect coral reefs. S. 725 would provide $12M over a three year period while S. 1253 would provide $100M over a five year period. Given significant declines in coral reef ecosystems and the time necessary to reverse this trend, we prefer the funding levels provided in S. 1253. We believe that such a significant increase is necessary to help stem the decline of coral reefs and coral reef ecosystems. S. 1253 also contains provisions such as a national program allowing NOAA to provide non-competitive grants and a requirement that the Secretary of Commerce consult with the Coral Reef Task Force on project proposals and approvals which would provide a more comprehensive process for restoring and conserving coral reefs.

At this time, one specific recommendation that we ask you to consider is providing a direct role for the Department of the Interior in the implementation of your coral reef legislation, especially for coral reefs under their jurisdiction. DOI has significant responsibilities related to coral reef protection including management responsibilities for coral reefs in national parks, national wildlife refuges and offshore of U.S. territories and possessions. Furthermore, the Secretary of Interior is a co-chair of the National Coral Reef Task Force that was formed to implement the Executive Order on coral reefs.

CONCLUSION

We commend the Subcommittee for its work on behalf of the National Marine Sanctuary Program and coral reefs. We look forward to working with you to develop legislation to reauthorize the National Marine Sanctuary Act, as well as comprehensive legislation to protect and conserve coral reefs.

July 7, 1999

Senator Olympia Snowe
Chairwoman
Subcommittee on Oceans & Fisheries
Senate Committee on Commerce, Science, & Transportation
428 Hart Senate Office Building
Washington, DC 20510

Dear Senator,

In response to your invitation to submit written testimony following the Subcommittee on Oceans and Fisheries' hearing on Coral Reef and Marine Sanctuary Conservation held on June 30, 1999, I submit herewith my written testimony for the record.

Due to our unique geography and geology, Coral Reefs and National Marine Sanctuaries are a fundamental part of everyday life in the Florida Keys, and I want to thank you for giving me the opportunity to express my thoughts and concerns regarding the future health of these national treasures.

Your interest in the health of the reefs and marine sanctuaries is greatly appreciated.

Sincerely,

NORA WILLIAMS
County Commissioner
Monroe County, Florida

PREPARED STATEMENT OF NORA WILLIAMS, MONROE COUNTY COMMISSIONER, MONROE COUNTY, FLORIDA

Madam Chairwoman, I appreciate the opportunity to submit this testimony for the Oceans and Fisheries Subcommittee hearing on Coral Reef and Marine Sanctuary Conservation.

Madam Chairwoman, the Florida Keys and their surrounding National Marine Sanctuary are facing a serious environmental problem that threatens the long-term health of the coastal waters of the Florida Keys. Inadequate wastewater and stormwater facilities in the Keys have led to a serious degradation of the near-shore waters in recent years, and unless this problem is solved, our nation can look forward to continued deterioration of water quality and the loss of a true tropical treasure.

Natural resource protection is a matter of dollars and cents for the Florida Keys, as our economy is dependent on the health of our waters. The marine systems of the Florida Keys represent the most productive fishery in the state and the third most productive on the eastern seaboard. Our tourism industry is largely dependent on SCUBA diving, sportfishing and other nature-based tourism activities.

Wastewater and stormwater are the principal sources of nutrients in our near-shore waters, and the construction of wastewater and stormwater facilities in the Keys is the most effective solution to the water quality problems that now threaten the Florida Keys. The Keys are an island chain made up of porous limestone rock and coral. This situation causes normal septic systems to be ineffective and makes it necessary to install expensive treatment facilities. These problems are compounded by the fact that we are a 100 mile long chain of thirty populated islands. As a result, because of our unique geography and geology, the needed facilities cost 3-4 times the national average and are, therefore, truly unaffordable without federal assistance.

The United States Congress recognized the value of the Florida Keys in 1990 and passed legislation establishing the Florida Keys National Marine Sanctuary. That legislation mandated that the Environmental Protection Agency and the State of Florida develop a water quality protection program for the sanctuary. The plan has been completed. We now know what needs to be done. But required measures are so costly they cannot be achieved with local and state resources alone. At present, there is no federal funding source to help our community make the necessary water quality improvements.

Your Subcommittee is considering legislation which provides funding to help restore the health of the nation's ailing coral reefs and assist in maintaining the long-term wellbeing of these fragile ecosystems. The efforts proposed represent an important step forward, but they will not solve the serious pollution problems that face the Florida Keys National Marine Sanctuary. Significant federal funding for wastewater treatment facilities is essential. If these kinds of facilities are not constructed, other conservation measures will not make a substantial difference in our near-shore waters. Wastewater and stormwater are the problem, and if we do not fix the problem, the environmental quality of the Florida Keys Marine Sanctuary will continue to deteriorate and a precious national resource will be lost.

Madam Chairwoman, I applaud this Subcommittee for considering the possibility of dedicating federal funds to preserve, sustain, and restore the health of the coral reef ecosystems before these precious treasures are irreparably damaged. I would also ask every member of this Subcommittee to make a further effort directed specifically at the severe problem now facing the Florida Keys National Marine Sanctuary. A national treasure is now at risk in the Florida Keys, and our near-shore waters are deteriorating. A solution has been identified, but Monroe County and the State of Florida cannot carry the burden alone. The Federal government needs to help. I ask, therefore, that every member of this Subcommittee work with other Committees of the Congress to fully fund the wastewater improvements that are necessary to preserve the integrity of the Florida Keys National Marine Sanctuary.

Madam Chairwoman, the *Miami Herald* and a local Florida Keys newspaper *Solares Hill* recently published articles on this topic, and I would like to request that the text of each of these be printed as a part of my testimony.

I thank you for this opportunity to address the Subcommittee.

PREPARED STATEMENT OF DEBRA S. HARRISON, AICP, FLORIDA KEYS DIRECTOR, WORLD WILDLIFE FUND

Madam Chair, Members of the Subcommittee, thank you for the opportunity to testify concerning the reauthorization of the National Marine Sanctuaries Act. I am a long-time resident of the Florida Keys, where I have served as a member of the

Florida Keys National Marine Sanctuary Advisory Council for three and a half years. I also serve as a member of the South Florida Regional Planning Council and the Governor's Commission for a Sustainable South Florida. I recently received the coveted Chevron Conservation Award in recognition of more than twenty years of actions to protect the Florida Keys and South Florida ecosystem. I appreciate this opportunity to share from my experience in the Florida Keys why I strongly believe that the National Marine Sanctuaries Act should be reauthorized.

The Florida Keys are home to one of the world's richest and most diverse marine ecosystems. Its treasures include the third-largest coral barrier reef in the world; expansive shallow water flats and sea-grass meadows; hundreds of mangrove islands surrounded by patch reefs and hard-bottom communities. The array of wildlife of this special ecosystem includes wading birds, osprey, bald eagles, endangered diminutive Florida Key deer, sea turtles, and oceans teaming with reef fish, lobster, shrimp, shark and dolphin, permit and bonefish, just to begin the list.

So revered are these resources that the federal government has established four National Wildlife Refuges, three National Parks, thousands of acres of Wilderness Designated Area, and this country's second largest National Marine Sanctuary, all within the Florida Keys ecosystem. The Florida Keys receive four million visitors a year from around the nation and around the world, lured by its incredible beauty and diversity.

But protecting the natural resources of the Keys has not happened without controversy. The Keys are an archipelago consisting of dozens of small islands historically isolated from the mainland. The population of residents that chose to carve out a living here decades ago struggled for survival. In this subtropical climate with little freshwater, few amenities and a multitude of natural challenges, such as hurricanes and mosquitoes, life was hard. Those that survived did so with a fierce sense of independence.

This century brought modern amenities to the Keys, such as a transportation network linking the islands together in a chain to South Florida, a freshwater pipeline, electricity, mosquito spraying, air conditioning, and finally, cable television. As a result, the Keys grew into one of the most sought-after destinations for those fleeing the cold, gray winds of northern winter months.

Development boomed. Lands were plotted, forests bulldozed, canals and channels dredged. By the mid-seventies, the Florida Keys had been designated an Area of Critical Concern by the State of Florida because of the wholesale destruction of the Keys natural resources that the state had defined as the "crown jewel" of Florida. The last twenty-five years have been a textbook example of the challenges and successes of bringing balance to the efforts to intertwine economic stability with environmental protection. That balance has not come easily.

In the mid-80's, extensive efforts were underway to gain control of rampant overdevelopment of the Florida Keys. Local comprehensive plans were being re-written, federal refuge mangers were struggling with protecting endangered species, and programs to address water quality degradation from untreated human sewage were being discussed. Rapid development of the Keys was resulting in excessive demands for new infrastructure and public facilities and that, along with a spiraling demand for growth, exacerbated the already high cost of living, and all for a degraded quality of life and natural resource base.

The Keys became a battleground for efforts at the local, state and federal level to balance necessary resource protection with local economic interests. Those efforts were further complicated by the residents' traditional sense of independence and isolation. During the height of that battle, legislation was introduced in the U.S. Congress to establish the Florida Keys National Marine Sanctuary (FKNMS). It was expected that the proposal would be met with controversy. What is noteworthy is that less than a decade after its introduction, the FKNMS is fully embraced by the Florida Keys public.

The FKNMS serves as a model for the establishment of resource-management programs globally. So impressive was the public-participation element of that effort that the U.S. General Accounting Office hailed NOAA's process in its October, 1995 report to Congress. In the report, entitled Restoring the Everglades: Pubic Participation in Federal Efforts, the GAO recommended that the Interagency Task Force on the South Florida Ecosystem "develop a strategy to improve collaboration with nonfederal stakeholders in coordinating environmental restoration activities in South Florida and *should view as examples the processes used by NOAA to develop a comprehensive management plan for the Florida Keys National Marine Sanctuary...*" (emphasis added). Appendix II of the GAO report outlines the process and efforts to manage the FKNMS.

The GAO also recognized the contentious nature of environmental protection efforts and found that "although consensus among federal and nonfederal stake-

holders is desirable, *restoration efforts are inherently contentious and consensus on solutions that directly affect various interests may not be attainable. In addition, dissatisfaction with the process for nonfederal involvement expressed by stakeholders directly affected by a public policy decision often cannot be dissociated from their dissatisfaction with the outcome of the process. Therefore, the most that federal agencies may be able to achieve is an open airing and full consideration of all views within the constraints imposed by external factors"* (emphasis added).

The controversy surrounding federal resource protection efforts in the Florida Keys cannot be understated. Coalitions were formed to obstruct those efforts, including bringing in national Wise Use affiliates, such as the Center for Defense of Free Enterprise. The hanging of effigies, demonstrations and public protests were commonplace. The opposition to the FKNMS was well-organized and highly effective. The message disseminated was not one of opposing protection of the resource, but of an anti-federal control theme. "We don't need more Federal control in the Keys" was the campaign cry of Sanctuary opponents. The message galvanized local constituents who were already discontent due to a preceding decade of local, state and federal agency restrictions intended to reverse the rampant destruction of nationally important resources.

What truly sets the work of NOAA apart from other resource-protection efforts undertaken both in the Keys and nationally has been the open process that has allowed public buy-in to the outcome of that process. While the activities surrounding adoption of the FKNMS management plan involved high levels of controversy, today, just two years after the final adoption of the plan, the FKNMS now enjoys overarching support for the program. Evidence of that level of support is demonstrated by radio and newspaper advertisements by local businesses and Chambers of Commerce throughout the Keys advertising the FKNMS. Public participation in FKNMS education and volunteer programs is skyrocketing. The FKNMS is viewed by the general public as a positive community program.

The latest example of the success of the FKNMS is exemplified by the unanimous consensus that was developed around the establishment of an ecological reserve in the area of the Dry Tortugas. Known as T2000, the planning process engaged a broad Working Group consisting of sportsfishers, commercial fishers, divers, business representatives, and conservationists. The outcome of the Working Group was then forwarded to the FKNMS Advisory Council where it again received unanimous approval. Building that kind of support in the Florida Keys has historically been impossible to accomplish. The work and approach of NOAA in conjunction with the FKNMS and the T2000 process has truly changed the way conservation initiatives can be achieved in the Florida Keys.

I believe that the Florida Keys experience with the National Marine Sanctuaries program provides an important example of why the National Marine Sanctuaries Act must be reauthorized. If a program to protect one of the most ecologically diverse and important marine ecosystems in the world can succeed in collaboration with a local public that is highly suspicious of federal resource protection programs, then this program, I believe, can excel anywhere. The Florida Keys story has truly been a success story for the effectiveness of the National Marine Sanctuaries Program.

Sen. Snowe, Members of the Committee, thank you for your work on behalf of America's marine resources, and for the opportunity to provide testimony to you. I shall be pleased to work with you and help in any way that I can.

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