S. HRG. 105–819

ESTUARY RESTORATION AND COASTAL WATER CONSERVATION LEGISLATION

HEARING

BEFORE THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS UNITED STATES SENATE

ONE HUNDRED FIFTH CONGRESS

SECOND SESSION

JULY 9, 1998

ON

S. 1222

A BILL TO CATALYZE RESTORATION OF ESTUARY HABITAT THROUGH MORE EFFICIENT FINANCING OF PROJECTS AND ENHANCED COORDINATION OF FEDERAL AND NON-FEDERAL RESTORATION PROGRAMS, AND FOR OTHER PURPOSES

S. 1321

A BILL TO AMEND THE FEDERAL WATER POLLUTION CONTROL ACT TO PERMIT GRANTS FOR THE NATIONAL ESTUARY PROGRAM TO BE USED FOR THE DEVELOPMENT AND IMPLEMENTATION OF A COMPREHENSIVE CONSERVATION AND MANAGEMENT PLAN, TO REAUTHORIZE APPROPROPRIATIONS TO CARRY OUT THE PROGRAM, AND FOR OTHER PURPOSES

H.R. 2207

AN ACT TO AMEND THE FEDERAL WATER POLLUTION CONTROL ACT CONCERNING A PROPOSAL TO CONSTRUCT A DEEP OCEAN OUTFALL OFF THE COAST OF MAYAGUEZ, PUERTO RICO

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ESTUARY RESTORATION AND COASTAL WATER CONSERVATION LEGISLATION

THURSDAY, JULY 9, 1998

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
Washington, DC.

The committee met, pursuant to notice, at 9:03 a.m. in room 406, Senate Dirksen Building, Hon. John H. Chafee (chairman of the committee) presiding.

Present: Senators Chafee, Allard, Sessions, Lautenberg, and Lieberman.

OPENING STATEMENT OF HON. JOHN H. CHAFEE, U.S. SENATOR FROM THE STATE OF RHODE ISLAND

Senator CHAFEE. The committee will come to order.

I would like to welcome everyone and thank all the witnesses for appearing here this morning.

The purpose of this hearing is to learn more about three bills pending before the committee that pertain to the quality of the Nation's estuaries and other coastal waters.

Since the enactment of the Clean Water Act in 1972, we've made great progress in cleaning up the waters in our lakes and rivers and streams and the coastal waters of the U.S. It's really been remarkable. It hasn't just been the Federal Government, it's been the wonderful cooperation of industry and, obviously, the municipalities have been deeply involved with it likewise.

Despite the marked success of the last 25 years, we still face many challenges. Two of the bills before us today, S. 1222, the Estuary Habitat Restoration Partnership Act, and S. 1321, the National Estuary Conservation Act, are dedicated to protecting and restoring estuaries in our coastal communities.

Now, what are estuaries? Estuaries are bays and gulfs and inlets and sounds where fresh water meets and mixes with salt water from the ocean. They are some of our most valuable natural resources. Regrettably, in recent years millions of acres of estuarine habitat have been destroyed and degraded by pollution, development, or overuse.

The good news is that estuaries can be brought back to life. I had the opportunity to visit an effort in connection with that in Narragansett Bay in Rhode Island last Monday, where I saw the planting of eel grass that is taking place there. It's a small start, but it's a start.

S. 1222, which I introduced in September of last year, will help rebuild degraded estuarine habitat by providing real incentives for

communities to carry out estuarine restoration projects. That bill creates strong and lasting partnerships between public and private sectors and among all levels of Government to restore, hopefully, a million acres of estuarine habitat by the year 2010, which isn't so far away, that's only 12 years from now. To ensure that restoration efforts buildupon past successes, S. 1222 brings together the existing Federal, State, and local restoration plans, programs, and studies.

S. 1321, which was introduced by Senator Torricelli last year, would reauthorize the National Estuary Program under Section 320 of the Clean Water Act. Since the establishment of the National Estuary Program, which is part of the Clean Water Act, in 1987, 28 estuaries of national significance have been designated to receive funds for the development of conservation and management plans. Senator Torricelli's bill would allow these plans to be set in motion.

In addition to the two estuary bills, the committee will receive testimony on H.R. 2207, the Coastal Pollution Reduction Act, which the House passed last year. H.R. 2207 would allow the Puerto Rico Aqueduct and Sewer Authority, better known as PRASA, to apply to the EPA under Section 301(h) of the Clean Water Act for a waiver of its secondary treatment requirements for waste water. The Commonwealth of Puerto Rico has been involved in a 15 year dispute with EPA over its failure to meet secondary treatment requirements under the Clean Water Act.

The condition of estuaries and other coastal waters is an important national priority. I look forward to hearing our witnesses' views on the bills before us and their suggestions for what we can do to improve the quality of the Nation's estuaries and other coastal waters.

Senator CHAFEE. I see our esteemed colleague is here. Senator Lieberman, if you have some comments, this would be a good chance.

OPENING STATEMENT OF HON. JOSEPH I. LIEBERMAN, U.S. SENATOR FROM THE STATE OF CONNECTICUT

Senator LIEBERMAN. Thank you, Mr. Chairman. Thanks for holding this hearing. I would like to speak about two of the bills that we're considering this morning, S. 1222, of which you were the principal sponsor of, the Estuary Habitat Restoration Partnership Act, and S. 1321, the National Estuary Conservation Act.

These are especially important to the State of Connecticut and to our region. I'm very pleased to be a cosponsor of both of the bills. I particularly thank you for your leadership on them.

I know, Mr. Chairman, that we share the view that our estuaries are national treasures which are often not adequately appreciated. Without a healthy and productive Long Island Sound, and might I add as well Narragansett Bay, the quality of life in our States would be greatly diminished.

As John Atkin, the executive director of our Save the Sound, has said, "Not only is Long Island Sound an invaluable economic and recreational resource, it is also a provider of immeasurable pleasure and happiness for tens of thousands of residents and visitors alike." I'm pleased to note that John is with us today. He came

down to show his strong support for this legislation, and I thank him for the work that he has done.

The water surface of Long Island Sound is an example. It measures 1,320 square miles. It is located in one of the most densely populated and developed areas of our country; 15 million people live within 50 miles of its shores. Despite years of heavy industrial use, Long Island Sound is still known for its distinctive habitat types, including tidal wetlands, tidal flats, beaches, dunes, bluffs, rocky tidal areas, eel grass, kelp beds, and natural and artificial reefs, and its shellfish and finfish production is extraordinary. The shellfish industry alone is a $70 million industry annually. And the Sound is actually the leading producer of oysters along the entire East Coast.

The Sound supports more than $5 billion a year in water quality-dependent uses——a remarkable number——which includes beaches, swimming, and boating, but does not include the more difficult to quantify assessments of the importance of good water quality, the nature habitats, and near shore residential property values. Unfortunately, pollution has had an immediate impact on the quality of life and the economic benefits from Long Island Sound, which was described by one observer as an ''urban sea under siege.'' It is to turn back this siege and defeat it that I think these two pieces of legislation before us are devoted.

The State of Connecticut itself has had an aggressive effort to restore the Sound which has certainly helped the Long Island Sound program, one of the most successful efforts under the National Estuary Program. After years of study and public participation, which has mirrored the public interest in the Sound, it has produced a comprehensive plan for action and, in fact, implementation is underway.

Real progress is being made. In 1997, water quality monitoring results were among the best conditions ever observed. Of course, this is only a start. There is a lot more to be done. In February, the program adopted two critical elements of the clean up and restoration phase; a Phase III nitrogen reduction plan which calls for a 60 percent cut in nitrogen loadings over the next 15 years, and a habitat restoration plan. The effort is expected to cost New York and Connecticut $650 million, of which Connecticut has already pledged $100 million of its Clean Water State funds to implement the Phase III program.

This is where I come to your bill, Mr. Chairman, because it will go a long way toward helping Connecticut meet the second goal of its Phase III program for Long Island Sound, which is habitat restoration. By making Federal funding available in partnership with local Government and private sector contributions, this bill can help meet the Long Island Sound Study Committee's goal of restoring more than 2,000 acres of critically important tidal wetlands and 100 miles of streams in Connecticut and New York.

The fact is that Long Island Sound has already lost almost 70 percent of its original wetlands, with far reaching impacts on the biological diversity of not just the Sound, but the region and, certainly, the water quality of the estuary. I'm very pleased that a major habitat restoration project is already underway in the Sound with grant money from the Long Island Sound program office

which this committee, in its wisdom, established in 1990. Funding from your bill would greatly enhance those efforts.

S. 1222 is based on I think a very sensible concept of community-based restoration efforts. It would leverage up to $10 of on-the-ground restoration work for every $1 in Federal funding, and would create market-based incentives for the private sector to work with community-based organizations and local Governments on restoration efforts.

Mr. Chairman, the second bill, very briefly, we're considering today, the National Estuary Conservation Act, is also critical to our efforts to clean up Long Island Sound because the cost of implementing the Sound's comprehensive management plan is high; it cannot be met without Federal grants for implementation. S. 1321 would, to make a long story short, ensure that the funding is available.

So these are two very important bills for the Sound, for the region, and I think ultimately for the country. I thank you for your leadership on them, and I hope we can move forward with them in this Congress. Thank you.

Senator CHAFEE. Thank you very much, Senator.

Senator Sessions, we're delighted you are here. If you've got some comments, this would be a good chance.

OPENING STATEMENT OF HON. JEFF SESSIONS, U.S. SENATOR FROM THE STATE OF ALABAMA

Senator SESSIONS. Briefly, Mr. Chairman, thank you for your leadership on this issue. I had the opportunity earlier this spring to tour the Mobile Bay Estuary program. We travelled in boats through the delta and observed what was going on there. I met the people who had been working on it.

I am very favorably impressed with this concept of how to deal with environmental problems on an area like an estuary. What I have observed over the years is that the problem is complicated by so many different governmental agencies and private institutions that are involved. You may have two or three counties, several cities, regional boards and planning agencies, as well as Federal, State agencies involved.

This estuarine program provides a way to have an inventory and an analysis and evaluation of the problems, what is causing them, and how to go about fixing them. I think it is a real good concept. I would like to see it continue, and I appreciate your leadership in this regard. It's a volunteer program. The only thing I think that would threaten it would be that if our program becomes some sort of management or directing agency rather than a community coordinating effort, because these are non-elected people, in effect, unaccountable to the public.

So if we can create a way in which all the leadership in the whole estuary area can come together to identify the problems that are the primary threats to the estuary and develop a voluntary plan with some support from the Federal Government to help fix it, I think we can achieve great results and maintain harmony and maintain the voluntary support of the local governments and private industries. I think it is a very attractive program, and I appreciate your leadership.

Senator CHAFEE. Thank you very much, Senator.

Senator Lautenberg, we're just about to start. Do you have a comment that you want to make at this time?

OPENING STATEMENT OF HON. FRANK R. LAUTENBERG, U.S. SENATOR FROM THE STATE OF NEW JERSEY

Senator LAUTENBERG. I'm pleased to have a chance to participate in today's hearing on two important bills before the committee, both of which I'm happy to cosponsor, one drafted by the chairman, Senator Chafee, and the other by my New Jersey colleague, Senator Torricelli. They both address the vital need to protect and restore America's estuaries. They recognize that the problem is a national one, not just State or local concerns.

The health of our estuaries is threatened from a variety of sources. In my own State of New Jersey, for instances, the most densely populated State in the Union, estuaries are coming under increasing pressure from exploding population growth. The 673 coastal counties in the United States contain 53 percent of our population. More people want to live in coastal States. Especially as the baby-boomers begin retirement, we've got to focus more than ever on the protection of these estuaries.

The Barnegat Bay Estuary, located off New Jersey's Ocean County toward the southern coast of our State, is an extremely delicate ecosystem that deserves increased protection. Despite tremendous population growth, the Bay continues to host a variety of life——plants, crabs, shrimp, minnows, wheatfish, bluefish, also some interesting bird life from herons to egrets. Yet, agricultural runoff, increased recreational activities, and a booming homebuilding industry continue to threaten the Bay.

New York and New Jersey Harbor Estuary, a major shipping channel, which is also home, despite the competition from industry, to a great array of wildlife, faces a problem of contaminated sediments. This important watershed was recently identified by EPA as an area of probable concern due to the abundance of toxins such as PCBs, mercury, and dioxin.

Both pieces of legislation before us recognize that the Federal Government cannot protect and restore estuaries all by itself. We've got to work in partnership with States, localities, regional authorities, and dedicated citizens to restore these invaluable ecosystems. I look forward to hearing from the witnesses before us on how we can best maximize the resource of all these partners.

I thank you, Mr. Chairman, and fellow committee members, for your indulgence.

Senator CHAFEE. Thank you, Senator.

Now, we have a distinguished colleague from North Carolina, Senator Faircloth. Senator Faircloth, why don't you just sit right here at the table. We're going to get right to you. We welcome you here.

STATEMENT OF HON. LAUCH FAIRCLOTH, A UNITED STATES SENATOR FROM THE STATE OF NORTH CAROLINA

Senator FAIRCLOTH. Thank you, Mr. Chairman, and Senator Sessions, Senator Lautenberg, Senator Lieberman. I thank you for giving me the chance to be here.

Two years ago, the North Carolina Coastal Federation asked me to support what is now Senate Bill 1222, the Estuary Habitat Restoration Act. I understand that Melvin Shepard, the president of the Coastal Federation is here today, and I hope he is.

Although I have spent a good part of my life in and around the coastal sounds and rivers of Eastern North Carolina where I was reared, until I started looking at this bill and what it could do, I really had never realized the full importance of these waters to the State and to the Nation. We have over 2.2 million acres of estuary in North Carolina. The commercial and recreational fishing industry is dependent upon these waters, and that is big industry at home. More than 90 percent of North Carolina's commercially important species of fish and shellfish spend part of their lives in North Carolina estuaries.

Now, Senator Chafee and Senator Lautenberg and Senator Lieberman, 50 percent of the fish that you catch off the coast of Rhode Island, New Jersey, or Connecticut were spawned in North Carolina waters.

Senator LAUTENBERG. Thank you.

[Laughter.]

Senator FAIRCLOTH. We send them to you.

Senator LIEBERMAN. Could you add a little salt.

[Laughter.]

Senator FAIRCLOTH. We were thinking about putting a fee on it, but we haven't gotten around to it yet.

[Laughter.]

Senator FAIRCLOTH. But, in short, our ability to have seafood in this Nation depends upon maintaining healthy and productive coastal waters. This bill will enable communities to work restoring degraded estuaries across the country. And as Senator Sessions says, it is going to do it in a very productive and forthright manner.

It is vital that we target needed resources to restore and preserve our Nation's estuaries. The goal of the bill is ambitious; a million acres to be restored by the year 2010, and North Carolina is figuring on restoring 100,000 acres alone. So a tenth of the goal would be in North Carolina alone for the next several years. S. 1222 sets a new and innovative way of making this happen. It will help the communities to restore habitat critical to preserving the Nation's estuaries.

The bill is also important because it sets out a new way of building a genuine partnership between our communities and the States and the Federal Government. This is maybe the most important part of it. It makes sure that we listen to the citizens, build from what we know, and coordinate and streamline the programs that are already there.

The level of support the bill has received speaks well of the potential value of the legislation to so many American coastal communities and says a great deal about the stature of Senator Chafee, as chairman of the Senate Environment and Public Works Committee, and his work on behalf of the committee. I am committed to working with you, Mr. Chairman, to move the bill this year.

Mr. Chairman, I would like to suggest that we move the estuary bill as part of the Water Resources Development Act Reauthoriza-

tion to ensure that it gets done this year. I believe this would make good sense since the estuary bill makes the Army Corps of Engineers the lead agency in the restoration of the estuaries. We need to make sure that S. 1222 is a part of reauthorization. If we don't, a good bill, and one that builds bipartisan bridges as it restores the estuaries, could get devoured and bogged down in the much larger and more charged debate that we're going to have on the Clean Water Act next year.

Last, I want to welcome a distinguished North Carolinian who will be testifying later today, Dr. Joann Burkholder. Dr. Burkholder is well-known as one of the Nation's leading research scientists and one of the discoverers of Pfiesteria, the microbe that has raised so much havoc among all costal waters, and Maryland and North Carolina have particularly been hit hard with it. She will be testifying to the serious consequences which can come from degraded estuaries.

Dr. Burkholder, it's nice to have you with us today.

I thank you, Mr. Chairman.

Senator CHAFEE. Thank you very much, Senator. I think there are several good points you made there in your testimony. I think it is important for us to realize that, as you said, 90 percent of the commercial fish caught by North Carolina fishermen had spent a portion of their lives in the estuaries. That's true in the Gulf, for example, likewise. So, these estuaries are of extraordinary importance.

Second, your suggestion about combining the bill with the other legislation that we will be considering later on is a thoughtful one. Let me think about that because the other legislation, the Water Resources Development Reauthorization, does look as though that's going to go somewhere, and I think your point is a good one. Let's think about that.

And third, I would note that we have 26 cosponsors of this legislation, not only each of the Senators who are here today, but others likewise. So we're very optimistic on this legislation.

Thank you for your help, Senator Faircloth.

Senator FAIRCLOTH. Thank you, Mr. Chairman.

Senator CHAFEE. It's my understanding that Senator Torricelli is going to drop by at some point, and we will take him when he comes by.

But meanwhile, why don't we have Mr. Wayland, Director of the Office of Wetlands, Oceans and Watersheds, U.S. EPA, and Mr. Michael Davis, Deputy Assistant Secretary for Civil Works, U.S. Department of Army, come up.

We will start with Mr. Wayland. Why don't you proceed.

STATEMENT OF ROBERT H. WAYLAND III, DIRECTOR, OFFICE OF WETLANDS, OCEANS AND WATERSHEDS, ENVIRONMENTAL PROTECTION AGENCY

Mr. WAYLAND. Thank you very much, Mr. Chairman. Good morning, members of the committee. You have a great sense of timing. This hearing occurs during the International Year of the Ocean and the Nation is examining its stewardship responsibilities toward our coastal waters. Very recently at the National Oceans Conference in Monterey, the President committed to a series of actions in recogni-

tion of those responsibilities and again pledged the Administration to implement, with assistance from Congress, a Clean Water Action Plan. That plan, undertaken in recognition of the progress made and challenges remaining after a quarter of a century——

Senator CHAFEE. I wonder if you could hold 1 minute. I didn't see Senator Allard come in. I'm sorry. Did you have any comment to make?

Senator ALLARD. Mr. Chairman, I don't have any comments. I appreciate the chair recognizing me. Thank you.

Senator CHAFEE. I apologize for not catching you.

All right, Mr. Wayland, why don't you proceed.

Mr. WAYLAND. As I was saying, the Clean Water Action Plan, which the Administration has developed, recognizes the many challenges and the significant progress made since the Clean Water Act was first authorized a quarter of a century ago. It contains numerous actions directed to marine and estuarine protection and restoration. Those actions have been significantly influenced by our experience over the last decade in implementing the National Estuary Program.

That program was established by Congress in 1987 to demonstrate a new framework to address serious environmental problems faced by these valuable ecosystems. Estuaries are particularly vulnerable because they often serve as sinks for pollutants originating upstream within the watersheds and the airsheds overlying them. In addition, estuaries are directly impacted by human activity. Well over half the people in this country live, work, or play near the coast. The NEP seeks to protect and restore the health of estuaries and their living resources, and in so doing, the recreation, fishing, and other economic activities that take place in or depend on healthy estuaries.

Just a few indications of how valuable these resources are: Coastal waters support 28.3 million jobs and generate $54 billion in goods and services every year. The coastal recreation and tourism industry is the second largest employer in the Nation, serving 180 million Americans visiting the coast each year. And the commercial fish and shellfish industry contributes $45 billion to the economy every year, while recreational fishing contributes $30 billion to the U.S. economy annally.

A recent national assessment concluded that the most common problems NEPs are dealing with are nutrient over- enrichment, pathogen contamination, toxic chemicals, alteration of freshwater flows, the loss of habitat, and declines in fish and wildlife as well as the introduction of invasive species. We have every reason to believe that these problems are common to most coastal watersheds throughout the United States. And the impacts are serious. Pathogens cause shellfish bed closures, nutrient over-enrichment contributes to——

Senator CHAFEE. What is a pathogen?

Mr. WAYLAND. Pathogens are microscopic organisms that are destructive to other living organisms; it may be fish, it may be human beings.

Introduction of invasive species adversely affects native species. Many of you are familiar, of course, with the zebra mussel which

is a freshwater invasive species. Our coasts are afflicted with invasive species transported in ballast water.

Changes in land use and the introduction of pollutants and toxic chemicals results in habitat loss and declines in water quality and ecosystem health overall. And we're all familiar with the impacts of harmful algae blooms. Pfiesteria outbreaks have occurred in several tributaries to the Chesapeake Bay and North Carolina rivers in recent years resulting in fish kills, fish lesions, and suspected human impacts. The death and decay of algae blooms can lead to partial oxygen depletion, known as hypoxia, or total oxygen depletion, known as anoxia, in the water, resulting in widespread mortality of fish, shellfish, and invertebrates.

There's evidence that associates these algae blooms with nutrient pollution, excess nitrogen and phosphorous in the water. The source of these pollutants varies widely from one location to another. However, in general, we see three significant sources: human waste from septic systems and sewage treatment plants; agricultural runoff, including fertilizer and manure from agricultural operations; and air deposition of nitrogen and toxic pollutants from motor vehicles and electric utilities.

Unlike early approaches to environmental protection that targeted specific pollutants or categories of discharges, the NEP acknowledges that the problems affecting our estuaries are exacerbated by combined and cumulative impacts of many individual activities and that the significance of these activities varies greatly from watershed to watershed. The principal cause of nutrient overenrichment in Albemarle- Pamlico NEP, for example, is agricultural, while in Long Island Sound nutrient loadings come principally from domestic wastewater.

In order to address watershed wide concerns, the NEP encourages the use of a combination of traditional and non- traditional water quality control measures and resource management techniques. The NEP has strongly influenced our evolution toward watershed management more broadly in clean water programs.

A cornerstone of the National Estuary Program is that management decisions are made through an inclusive process involving multiple stakeholders, as Senator Sessions observed earlier. This emphasis on public participation not only ensures a balanced approach to resource problems, but encourages local communities to take the lead in determining the future of their own estuaries, thus bolstering the program's success through community support. At the present time, 17 of the 28 NEPs are in the implementation stage, 1 additional program is scheduled to have an approved plan by the end of 1998, and the 10 remaining programs should have their management plans completed in 1999.

The National Estuary Program has been very successful and several of those successes are presented in my full statement. EPA is working actively to ensure that we use what we've learned from these programs to protect and improve the health of coastal ecosystems overall.

With respect to the legislation that is the topic of this hearing, I would like to emphasize the Administration's position supporting comprehensive amendments to the Clean Water Act that would strengthen the protection of the Nation's waters, a position recently

reiterated by the President when he announced the Administration's Clean Water Action Plan.

That having been said, let me comment briefly on S. 1321, S. 1222, and H.R. 2207.

First, the National Estuary Conservation Act and also a provision of H.R. 2207. Both of these bills would amend Section 320(g) of the Clean Water Act and increase the authorization of the National Estuary Program. EPA supports the flexibility that would be provided by giving us the authority to allow grantees to use Section 320 funds for managing the implementation of CCMPs as well as for developing them.

We believe it is important, however, that State and local Governments take primary responsibility for implementing CCMP actions, and that consistent with the current law, grants authorized by Section 320 not be seen as the primary source of implementation funds. EPA and its other water quality programs have an important role in implementation.

Section 320 provides that the management plans, once approved by the Administrator, can be implemented using funds from the State Water Revolving Loan Fund or the nonpoint source grants. Many CCMP implementation actions are appropriate for such funding. These programs should continue to be the primary source of implementation funds authorized under the Clean Water Act. The Administration has recently proposed to increase Section 319 grant funds to $200 million.

EPA also supports an increase in authorizations over the original $12 million given the increased number of estuarine programs since the program was last authorized.

With respect to S. 1222, the Estuary Habitat Restoration Partnership Act, we believe that the goals and purposes of this bill are laudable——a national goal of restoring a million acres of estuarine habitat by 2010. Many of our National Estuary Programs have identified the need to actively restore degraded habitats consistent with the Clean Water Act's broad goal to restore and maintain the physical, chemical, and biological integrity of our Nation's water.

S. 1222 would compliment other provisions of the Clean Water Act and move us in a direction of implementation provisions more attuned to restoration and physical integrity aspects of the Clean Water Act's goal. Chemical and physical improvements are needed to restore the conditions under which aquatic species can thrive in our estuaries.

We look forward to the opportunity to work with the committee as you continue your deliberations on this bill.

With respect to H.R. 2207, the Coastal Pollution Reduction Act, I need to stress that much of the progress toward our Clean Water Act goals has been realized through the investment of the private sector and local governments in achieving near universal compliance with the baseline of technology-driven pollution control and prevention requirements. That's best available technology for industry and secondary treatment for municipalities.

Secondary treatment isn't sufficient, however, to achieve nutrient control needs for such water bodies as Long Island Sound and the Chesapeake Bay where relatively shallow, poorly mixed waters are sensitive to nutrient inputs. In these instances, and many others,

municipal treatment facilities are using advanced wastewater treatment technology or biological nutrient removal.

Congress provided for a narrow waiver from the general requirement in Section 301(h) of the Clean Water Act for cases where a community discharging to ocean waters could demonstrate, among other things, that less than secondary treatment would not have significant adverse consequences. Few municipalities were eligible for this waiver by its very terms. Fewer still sought the waiver. And even fewer were able to make the necessary showings and were approved. The waiver provision required municipalities to apply by December 29, 1982, and didn't provide for reapplication in the event of a final denial.

H.R. 2207 would reopen the window for an application for a deep ocean outfall serving Mayaguez, Puerto Rico, but would require EPA to apply the same substantive standards for considering such a waiver that had applied to previous timely applicants.

The Puerto Rican Aqueduct and Sewage Authority first sought a waiver for the Mayaguez wastewater treatment plant to discharge into Mayaguez Bay, not a deep ocean site, in September 1979. EPA tentatively denied the application in 1984 and again in 1986. A final determination denying the application was issued in 1991. The applicant pursued appeals which culminated in the Supreme Court upholding EPA's decision in February 1995.

In a Consent Agreement to resolve process violations of, among other things, the effluent discharge limits on the existing plant, the Federal Government recognized PRASA's intent to seek this legislation but made no commitment regarding our position on the legislation.

Mayaguez Bay, in general, and the coral reefs, in particular, are severely stressed. Conditions may be such that PRASA may be able to provide information to support a decision that, based on construction of a deep ocean outfall, it can meet the nine part test established in Section 301(h). However, EPA neither endorses nor opposes H.R. 2207. We're generally opposed, however, to reopening the opportunity to seek 301(h) waivers given the widespread benefits of secondary treatment and the need to do more, not less, to control nutrients in many coastal areas.

Thank you very much, Mr. Chairman. I look forward to working with you and your staff as you continue your work on these bills. I'd be pleased to respond to questions.

Senator CHAFEE. OK. Thank you very much, Mr. Wayland.

Mr. Michael Davis, Deputy Assistant Secretary for Civil Works, Department of the Army.

STATEMENT OF HON. MICHAEL L. DAVIS, DEPUTY ASSISTANT SECRETARY FOR CIVIL WORKS, DEPARTMENT OF THE ARMY

Mr. DAVIS. Mr. Chairman and members of the committee, I am Michael Davis, the Deputy Assistant Secretary for Civil Works. I'm also very pleased to be here today to present the Department of the Army's views on S. 1222, the Estuary Habitat Restoration Partnership Act. With your permission, I will summarize my statement that I have submitted for the record.

Senator CHAFEE. We've never denied anybody the opportunity to summarize their statements.

[Laughter.]

Mr. DAVIS. I'll try to be brief. For over 200 years the Nation has called upon the Army Corps of Engineers to solve many of its water resources problems. Historically, the Corps has emphasized its flood damage reduction and navigation missions. In recent years, however, pursuant to Water Resources Development Acts, we have elevated our environmental restoration and protection mission to a level equal to our more traditional missions.

The Corps now uses its engineering, project management, real estate, and environmental expertise to address environmental restoration and protection problems throughout the Nation and the world. The Corps has a powerful tool kit of standing authorities and programs that can be brought to bear to help solve environmental problems.

Over the last decade alone, the Corps has helped to restore hundreds of thousands of acres of habitat, benefiting hundreds of fish and wildlife species. Examples include 28,000 of habitat restored for the Upper Mississippi River, hundreds of acres of coastal wetlands restored in Louisiana, 35,000 acres of flood plain and wetlands restoration underway along the Kissimmee River in Florida, and hundreds of acres of coastal wetlands restored by beneficially using dredged material.

If enacted, S. 1222 would add to the Corps' environmental portfolio. Specifically, S. 1222 would allow the Corps to use its unique skills to restore and protect estuarine habitat and help achieve an economically and environmentally sustainable future for the Nation and the world.

Throughout the world estuarine and coastal areas serve as focal points for human use and development. These same areas also perform critical functions from an ecosystem perspective, providing habitat and food for myriad fish and wildlife species. There is an urgent need to protect and restore these fragile ecosystems, recognizing the economic, social, and environmental benefits they provide.

As with many environmental issues, future generations depend upon our actions today. In this regard, we applaud the cosponsors of S. 1222 for their vision and leadership in this area.

The Department of the Army supports efforts to enhance coordination and efficiently financed environmental restoration and protection projects. The goal of restoring one million acres of estuarine habitat by the year 2010 is consistent with the President's Clean Water Action Plan and the goal of restoring 100,000 acres of wetlands annually beginning in the year 2005.

The proposed national framework, our national estuarine habitat restoration strategy should help partners identify and integrate existing restoration plans, integrate overlapping plans, and identify processes to develop new plans where they are needed. This framework document could help us maximize incentives for participation, leverage limited Federal resources, and minimize duplications of efforts.

The legislation is also consistent with the Coastal Wetlands Preservation, Protection, and Restoration Act, also known as the Breaux Act. This legislation has created a unique multi Federal and State agency partnership which is working to restore and pro-

tect approximately 73,000 acres of coastal wetlands in Louisiana over the next 20 years.

Thus, with a relatively few minor but important changes, the Department of the Army would be pleased to support S. 1222. I will note a few of the changes and clarifications that we would recommend.

First, it is unclear which, if any, agency is to lead the collaborative council. The language implies a lead role for the Department of the Army and directs the Secretary to convene meetings. Funds are also authorized to be appropriated to the Department of the Army to implement estuarine restoration and protection projects.

While S. 1222 does not explicitly state your intent, Department of the Army is prepared to take a leadership role if that is the desire of the committee and the Congress.

In order to maintain consistency and avoid confusion, I recommend that the bill's cost-sharing provision be amended to a 65 percent Federal cost share in accordance with WRDA 1986 and WRDA 1996. This is especially important since the bill states that estuarine restoration projects could be implemented under our aquatic ecosystem restoration authority pursuant to Section 206 of WRDA 1996.

We are concerned that S. 1222 deviates from the basic cost-sharing policies established in the Water Resources Development Acts for environmental restoration projects, and that the variation and range of the possible Federal cost- shares from 25 to 65 percent could cause confusion and reduce non-Federal participation.

Section (d)(1) of S. 1222 states that the collaborative council shall not select an estuarine habitat restoration project until each non-Federal interest has entered into a written cooperation agreement in accordance with Section 221 of the Flood Control Act of 1970. Our experience is that while the need to meet Section 221 requirements are still valid for most civil works projects, there are situations where these requirements eliminate potential non-Federal sponsors from consideration and reduce opportunities for environmental projects. For example, certain well-known and established environmental organizations could not serve as sponsors for environmental restoration projects under S. 1222 as introduced.

The Corps has put policies in place to enable consideration of nongovernmental organizations for Section 1135 projects, and our WRDA 1998 proposal contains provisions that would amend Section 206 of WRDA 1996 and Section 204 of WRDA 1992 to allow the Corps to consider where appropriate nongovernmental organizations as sponsors for environmental restoration and protection projects. Because of the similarities between these environmental authorities, we recommend revising S. 1222 to allow NGO's to sponsor estuarine habitat restoration projects.

Turning to the factors to be taken into account in establishing criteria for determining project eligibility, we recommend that the legislation require consideration of quality and quantity of habitat restored in relation to overall project costs. This will help with benchmark performance reviews and provide a context for providing trade- off decisions amongst various alternatives.

Many environmental restoration techniques and approaches are new, and when dealing with natural systems there is a need to test

new ideas, learn from successful projects, and learn from those that are not successful, and manage adaptively to adjust to ever-changing conditions. Adding a requirement for non-Federal sponsors to manage adaptively would encourage the partners to try out new ideas and learn more about how to restore and protect estuarine and coastal areas.

In conclusion, the Corps has been increasingly involved in recent years with efforts to protect and restore our estuaries. We are especially proud of our efforts in conjunction with Coastal America initiatives, such as a restoration of a coastal salt marsh area in the Galilee Bird Sanctuary in the chairman's home State of Rhode Island, the restoration of tidal wetlands in California's Sonoma Bay lands, and the Sagamore Salt Marsh restoration project in Massachusetts. Our fiscal year 1999 budget request includes study funds for ten potential projects directed at protecting or restoring the important functions of estuaries, as well as funding for many other activities that would be beneficial to the environment in or adjacent to our estuaries.

In short, Mr. Chairman, the Corps is serious about its environmental responsibilities and its environmental mission. With just a few minor modifications, S. 1222, if enacted, would add an important new tool to help us all protect and restore the Nation's estuaries.

My staff and I have enjoyed working with you and your staff on S. 1222 and other legislation before your committee, including our Water Resources Development Act proposal for 1998. We look forward to continuing this relationship as work on this important legislation continues.

Mr. Chairman, that concludes my statement. I would be pleased to answer any questions you or the committee may have.

Senator CHAFEE. Thank you very much, Mr. Davis.

What we'll do now, I see Senator Torricelli is here, we will proceed with his comments and then we will get back to some questions to Mr. Wayland and Mr. Davis.

Senator WE WELCOME YOU.

STATEMENT OF HON. ROBERT TORRICELLI, U.S. SENATOR FROM THE STATE OF NEW JERSEY

Senator TORRICELLI. Thank you very much, Mr. Chairman. Rarely have I given testimony on legislation where I felt more confident, noting that I'm here to testify on S. 1321 and my two cosponsors are the Senator from Rhode Island, Mr. Chafee, and the Senator from New Jersey, Senator Lautenberg. So I feel assured of fairly supportive commentary. I would also like to note that S. 1321 is cosponsored by Senators Moynihan, Graham, Lieberman, and Boxer.

Mr. Chairman, dealing generally first with the issue of our coastal maintenance and protection, let me offer both my support and congratulations for the committee in dealing under difficult circumstances. It is time in our country to recognize that our beaches and coastal areas are national resources, as important to our infrastructure as roads and schools and other items that we depend upon for commerce and our quality of life. Indeed, since the 1930's the Federal Government has recognized this with the creation of

the Beach and Erosion Board. And yet in recent years, it is becoming increasingly more difficult.

The current funding formula set by the 1986 Water Resources Development Act established the Federal contribution for beach replenishment at 65 percent. This is being threatened by an Administration proposal to have a Federal share of 35 percent. Let me make it very clear, Mr. Chairman, in the State of New Jersey, to which Senator Lautenberg will attest, the economic life of the State of New Jersey and the quality of life of our people is directly related to the maintenance of our beaches. Our beaches are important to the economic life of New Jersey, as the Pennsylvania Turnpike is for the economy of its State, or the New York Throughway is for the people who live in that State. It is used for commerce, it is used for our massive tourist industry, and for our quality of life. This kind of declining Federal contribution would be a direct threat to many coastal communities.

I am, however, here for a related subject, and that is the maintenance of our threatened estuaries. Estuaries of our States, Mr. Chairman, from which Rhode Island is centered, are an important part not only of our tourist industry but also our fishing industry—75 percent of commercial fishing in the United States rely on estuaries—in New Jersey this is particularly true with the Raritan Bay, the Delaware Bay, and Barnegat Bay. In our country today, 14.5 million jobs and 10 percent of our GDP is related directly to these coastal centers. My State of New Jersey has a $25 billion tourist industry, including boating and fishing industries that rely on these areas.

The size of these estuaries and the pressure upon them by development is extraordinary. To take one example, the Barnegat Bay in New Jersey, 400,000 people live on this precious environmental resource. The same things that have attracted clam and fish populations to be in these protected waters also attract people to develop their lands and use them for tourist purposes. In the summer, that 400,000 population doubles to 800,000 people. This very precious resource is also shared with 116 marinas and boatramps, a third of all boats in the State of New Jersey are registered in this one small estuary.

As one would imagine, this causes considerable pollution threats. Barnegat Bay alone in 1995, 1997, and as recently as last month has had problems with brown tide algae blooms caused, in part, by stormwater runoff. Another example of pollution threats, as I'm sure you've experienced in Rhode Island, is in the New York-New Jersey Harbor——we found 730 combined sewage overflows in that Harbor alone. It would take $2 to $6 billion to correct them.

Mr. Chairman, as I am certain you and I know Senator Lautenberg are aware, the single largest water pollution problem remaining in the United States are the combined sewage overflows. This is a major problem of these estuaries. It is the reason for the compromise of the water quality, the continued destruction of our fisheries, and the unavailability of some of these waters for tourist purposes.

In 1987 the Clean Water Act Amendments established a National Estuary Program. That was an important beginning in saving these estuaries. Over the years, 28 estuaries were designated,

3 alone in the State of New Jersey. The plan was the Federal Government would provide funds to the State and local governments to develop plans to save these endangered estuaries. Seventeen of the 28 estuarine plans have now been completed. The NEP has not been reauthorized since 1991 and today States cannot receive any Federal funding to implement their plans.

Our legislation, Mr. Chairman, is very simple. We have designed 17 of these plans to protect the estuaries, the Congress for two decades has recognized these plans as a priority, now it's time to actually begin the work. Under our legislation, we would begin authorizing $50 million to the State and local Governments to start implementing their plans. These plans obviously rely heavily on doing something with combined sewage overflow.

Mr. Chairman, it is simply time to begin to act. We know what needs to be done. We understand the science, we understand the engineering, and we know the threat. I believe $50 million is a modest beginning, but in some estuaries somewhere in the country we will at least begin to prove that these valuable resources can be saved. It is better now to begin in a modest method rather than not to begin at all.

Perhaps, Mr. Chairman, if we prove by these modest amounts that a few estuaries can be saved, fish populations will begin to return, tourists will enjoy the benefit of improvements to water quality, then we can begin to mount the kind of political coalition that will help us do this on a larger scale.

Mr. Chairman, thank you for allowing me to testify.

Senator CHAFEE. Thank you very much, Senator. We appreciate your thoughts.

Senator LAUTENBERG. I just want to thank Senator Torricelli for his interest in protecting our estuaries, as evidenced by this legislation. I think that he is absolutely right. We have done a sufficient amount of planning and I think now getting the funds, getting some assistance for the implementation of these programs is important. I once again salute the effort and will work hard with you to try to get it into place in New Jersey.

Mr. Chairman, as you know, the comparisons between our States go beyond size. We have a lot of coastline for a relatively small land mass. Our problems are not different. We invite habitation, we invite tourism, but that brings problems along with it. As Senator Torricelli aptly pointed out, sewage overflow occurs. I'm not sure which gets the prize for being the worst source for pollution—agricultural runoff, combined sewer overflows, or nonpoint source pollution. We know one thing—we see the constant degradation of fish population, damage to our recreational use, and the loss of an important asset. It does compare very favorably with basic infrastructure in our States and in our country.

Mr. Chairman, I welcome Senator Torricelli's comments and his active interest on the issue.

Senator CHAFEE. I think it was you, Senator Lautenberg, who mentioned in your opening statement that something to the effect that 55 percent of the population in the United States lives in coastal areas.

Senator LAUTENBERG. Right.

Senator CHAFEE. I suspect that percentage is growing, not declining. So it's a tremendous challenge.

Well, thank you very much, Senator Torricelli.

Senator TORRICELLI. Mr. Chairman, if I could just note in response to Senator Lautenberg's comments, as difficult as this problem is, there is reason to be hopeful. Last year, in visiting in the Barnegat Bay, after years in our State of dealing with industrial sources of pollution successfully, the fish populations were increasing. Crabs and clams were seen in areas where they had not been recognized for years. Nature is resilient if we give it a chance.

Senator CHAFEE. But we've got to give it the chance.

Senator TORRICELLI. You have to give it the chance. And that's all we're asking, some modest resources now to deal with these remaining threats to these estuaries. Nature will come back if we will do our parts.

Senator LAUTENBERG. Mr. Chairman, the clams that were such an important marine crop in New Jersey now get put into a natural washing machine. They're taken out of beds where there may be some pollution and put into other clean water areas and left there for a bit and nature takes care of it. So nature is working right along side of us and we have to just give her a little boost.

Senator CHAFEE. Right. Thank you very much, Senator.

Now, Mr. Davis, in your testimony, you outline some of the areas of success. Over the last decade the Corps has helped to restore hundreds of thousands of acres of habitat, 28,000 acres of habitat restored for the upper Mississippi, hundreds of acres of coastal, and so forth. What principally have you done to do that restoration? What steps have you taken? And what constitutes restoration?

Mr. DAVIS. Restoration, let me answer that part of the question first. Let's look at wetlands restoration, I think that will put it in the right context. If you look in the Southeast, hundreds of thousands of acres that have been diked off and drained. Former wetlands are now crop lands. You can go into these areas and plug up some of those ditches, knock down some of these little dikes, and restore the hydrology in that area, thus restoring what was formerly a wetland area versus creation, which is going into an area that was never a wetland and trying to do it there.

Senator CHAFEE. You mention invasive species. We're certainly seeing that up in my section of the country. We've got something called "phragmites" which, in my judgment, is overpowering many brackish ponds. What do you know about phragmites? Have you got a cure?

Mr. DAVIS. I've seen phragmites. I've seen a lot of it.

Senator CHAFEE. Oh, I've seen it, too. But that's not a qualification.

Mr. DAVIS. It is a problem. We've spent a fair amount of time just recently up in the Hackensack Meadowlands, which is a large wetlands complex that essentially has been overtaken by phragmites, and we're looking at ways to restore that area to the proper hydrologies and salinities that would preclude phragmites from growing and allow the native vegetation to return. It can be a problem. It is very much an invasive species.

There are a lot of invasive species. It's an issue we've got to deal with. Recently I looked at the Kenilworth Marsh restoration project

that we did here on the Anacostia River using dredged material. We have a problem there with the plant the purple lustrife which is also an invasive species. It's an issue we're grappling with. I think in some cases we have made some progress but we've got a lot of work to do.

Senator CHAFEE. Any thoughts, Mr. Wayland?

Mr. WAYLAND. I just wanted to supplement that. Mr. Davis referred to Coastal America, and one of the Coastal America projects that I participated in helping to launch in Senator Lieberman's State was actually being facilitated with ISTEA funds. I think that the work that you and this committee did on the new TEA-21 legislation is going to continue some of the opportunities.

Senator CHAFEE. Better keep it a secret that we're using the highway trust fund money to fight phragmites.

Mr. WAYLAND. Well, what happened in that instance was the phragmites was very much encouraged by the railbed that had been laid in the Northeast corridor without any opportunity for tidal flushing. No culverts, so that you walled off the tidal flushing and the fresh water areas.

By the Corps of Engineers designing appropriate placement of culverts and the use of ISTEA money to place those culverts, the hydrologic regime was restored such that the natural marsh grasses could come back and once again occupy that habitat rather than phragmites. And that's certainly appropriate.

Senator CHAFEE. Are you saying that if you can get a tidal flow in an area where phragmites is, that will kill it off?

Mr. WAYLAND. In some cases, there has to be more active management than that. In some cases there has to be hand removal. I'm not a big believer in herbicide use to try to restore the balance of nature, but in some cases that's been employed to help the process along. But if you don't do something to improve the salinity regime, you're probably going to be back where you were. That's why some of these measures like the one that we looked at in Connecticut are extremely important. And that's part of the plan for the Hackensack as well, to open up channels of flowing water to help reduce the problem.

Senator CHAFEE. OK. Let me just ask this question of both of you. One, I appreciate your support for S. 1222. The bill as drafted would, as you know, require EPA, the Corps, and other relevant Federal agencies, for example Fish and Wildlife or NOAA, to develop an estuarine habitat restoration strategy. Do you think it's possible for all of these Federal agencies to develop a strategy within the parameters of the bill?

What do you say to that, Mr. Wayland?

Mr. WAYLAND. Absolutely, Mr. Chairman. I think that we've got a history of cooperating in a number of cases on smaller scale efforts. I think this is an opportunity to try to look comprehensively at needs and opportunities to try to buildupon the smaller scale efforts that may have been undertaken in the context of a particular estuary. I think the agencies have a good track record of working together through Coastal America and other collaborative approaches.

Senator CHAFEE. Mr. Davis, what do you say?

Mr. DAVIS. I agree completely with that. I think the bill brings together the right mix of agencies, each of which can come to the table with kind of a unique perspective and unique tools and talents.

Senator CHAFEE. Now, Mr. Wayland, you commented on the Puerto Rico bill. If we pass that and EPA denied the application for a waiver, what is your best estimate for the expected time period for the construction and operation of a secondary treatment plant?

Mr. WAYLAND. The deadline that is specified in the Consent Agreement that the Government reached with PRASA is that there would be a secondary treatment facility on line by December 31, 2001. That's a pretty ambitious timeframe in which to site, construct, and operate a secondary plant.

Senator CHAFEE. You did make a point in your testimony, I'm not sure I can put my finger on it right now, where you pointed out that where the waivers have been granted in the past, I guess you're thinking of San Diego, it is an deep ocean outflow as opposed to this.

Mr. WAYLAND. San Diego was another legislative exception to the general requirements of the Clean Water Act that we grappled with after the standard window had closed. But there are many other waivers that were entertained under Section 301(h) and some were approved, many were denied, several were withdrawn.

In instances where those waivers were approved, we generally are finding deep water, a lot of mixing as a result of currents, and——

Senator CHAFEE. It seems to me that was the San Diego situation. It was a deep ocean.

Mr. WAYLAND. Yes. I believe the outfall is at 300 feet. The locations of the outfall that are being studied at least with respect to Mayaguez I understand would be on the order of 600 feet of water.

Senator CHAFEE. OK. Fine. Thank you very much gentlemen.

Now, we'll have the next panel. We have now four witnesses. There are liable to be some votes which will interrupt this, but let's get started.

We will start with Mr. Spalding, executive director of Save the Bay. Mr. Spalding, we welcome you here.

STATEMENT OF H. CURTIS SPALDING, EXECUTIVE DIRECTOR, SAVE THE BAY, PROVIDENCE, RI

Mr. SPALDING. Thank you, Senator Chafee. I have a chart I would like to put up here. As long as we brought it all the way from Rhode Island, I thought I better show it.

I gave the committee a longer statement, and I have some brief comments I would like to make now.

Senator CHAFEE. Fine.

Mr. SPALDING. On behalf of Save the Bay and Restore America's Estuaries, I would like to thank Senator Chafee and the committee for the opportunity to present testimony in support of S. 1222, the Estuary Habitat Restoration Partnership Act. Save the Bay is a member-supported nonprofit organization with 20,000 members. Our mission is to restore and protect Narragansett Bay and its watershed. Restore America's Estuaries is a coalition of 11 regional

coastal community-based environmental organizations, with a combined membership of over 250,000. Restore America's Estuaries' mission is to save and restore America's estuaries and coastal heritage for our children before it disappears.

Five years ago, over 20 estuary advocacy organizations met to discuss the future challenges of our Nation's estuaries and to set a course of action to meet these challenges. Many of our coastal areas were beginning to reap the benefits of the Clean Water Act. In Narragansett Bay, harbor seals and oysters were starting to return after decades of absence due to polluted water. Despite similar limited recoveries in many of our Nation's estuaries, we shared a deep concern that many species of fish, birds, and other animals were not recovering as we had expected. Also troubling, some of coastal areas not previously affected by water pollution were now in serious decline.

After months of inquiry and discussion, we saw that the problem with the health of our estuaries was no longer simply grossly polluted water, but the ongoing loss of habitat for fish, birds, shellfish, and plants along our shorelines and in our watersheds. Thus, in late 1994, Restore America's Estuaries was formed. It is a current partnership of 11 nonprofit organizations, from Seattle to Galveston to Maine, that compose Restore America's Estuaries. Over the past 4 years, each organization has identified and targeted the habitat resources in its own estuarine and coastal environment that are threatened and in need of restoration. Restore America's Estuaries has pledged collectively to restore one million acres of habitat in our Nation's estuaries by the year 2010.

The need is great. In coastal States, 55 million acres of wetlands have been destroyed. We need to turn the tide on this devastating trend and actually foster the rebirth of our estuaries and their critical wetlands.

In the estuary I know best, the need is especially critical. Narragansett Bay's natural systems contain eelgrass beds, salt marshes, and fish runs which allow it function healthily, but they are severely damaged or disappearing. The chart I brought down describes the percentage of salt marshes affected by different activities. Invasive plants, cutting/mowing, tidal restrictions, filling, ditching, and inadequate buffer zones are causing the decline. As you can see, all these impacts generally exceed 50 percent in our salt marshes. We only have 100 acres of eelgrass left in the Bay which once supported thousands of acres. Eelgrass prevents shoreline erosion, filters pollution, and provide clean water, food, shelter, and nurseries and breeding grounds for fish, shellfish, juvenile lobsters, and young fish.

We have a problem with fish runs, too. To survive, many fish must be able to get to the fresh water up the rivers to spawn. One of our Bay's greatest historic fisheries, the Atlantic Salmon, can now only be read about in books due to the destruction of their fish runs.

The Bay is much like the human body; the decline in our eelgrass, salt marshes, and fish runs are warning signs not so different from changes in a person's vital signs. We would not ignore a loved one's complaint of chest pains, shortness of breath, or numbness in their arms and legs because these are signs of poten-

tially deadly heart attack or damaging stroke. Likewise, we cannot ignore these symptoms in our estuaries.

If eelgrass, salt marshes, and fish runs continue to decline and disappear, the Bay will be little more than an empty body of water. The quantity of Bay life that depends on these areas——the lobster, shellfish, birds, fish, plants——will diminish. Many people who make their livelihoods off the Bay will have to find other work. This is not the kind of Bay we would want or should leave to our children.

Narragansett Bay is not alone in this health crisis. Although each estuary is unique, they all suffer from habitat loss. In San Francisco Bay, 95 percent of the Bay's original wetlands have been destroyed. Galveston Bay in Texas has lost 85 percent of its seagrass meadows. Louisiana loses 25,000 acres of coastal salt marshes——that's an area the size of Washington, DC——every year. In Chesapeake Bay, the oyster harvest crashed from 25 million pounds in 1959 to only 1 million pounds in 1989, and of course the Pfiesteria crisis is well known to everyone down here. These losses have dire consequences for our environment, our economy, and our way of life.

On September 22, 1997, Senator Chafee, the chairman of this committee, came to a small boatyard in Narragansett Bay to announce the introduction of the Estuary Habitat Restoration Partnership Act, S. 1222. This legislation is a vital component of our efforts to bring back healthy conditions not only in Narragansett Bay, but in Chesapeake Bay, Long Island Sound, Puget Sound, and many of the other vital estuaries in the United States. At that press conference, Senator Chafee said ''Narragansett Bay is good for the soul.'' No truer words have ever been spoken about the meaning of Narragansett Bay to all Rhode Islanders and no one in Rhode Island's history has more credibility to say these words.

Narragansett Bay is our home. Even if we live miles from its shore, it is part of what makes Rhode Island special. The Bay is our lifeline, it nourishes our environment, strengthens our economy, enhances our leisure time, protects our children's futures. We need to care for the Bay and invest today in its health and very survival. The investment will help ensure a secure future for Rhode Island and all the Nation's estuaries.

In the interest of time, I'm going to jump to the end of my comments, Senator Chafee, and talk somewhat about the connection to the WRDA Act.

Despite all that's been done, as I've said, Narragansett Bay and most of our estuaries remain in crisis. The migration of millions of people to the shores of estuaries has had its impact. Rhode Island and many other regions have only a limited time to take action and reverse the situation. If we do not markedly increase our effort to restore America's estuaries soon, more species of fish, plants, birds may become memories just like the Atlantic salmon and Bay scallops have become in Narragansett Bay. Without action now, jobs will be lost and the quality of life will suffer.

We applaud you for your leadership on this critical issue, and we applaud the support of Senator Faircloth and now the support of the Army Corps of Engineers and EPA. Not only has Senator

Faircloth come to the issue, but 26 colleagues from both sides of the aisle understand the situation and have cosigned as sponsors.

If we truly want to preserve our coastal heritage, we must give our Federal Government agencies the opportunity to actually help with this task, not just with more funding, but with tools to break down the barriers of bureaucracy and to build partnerships with local community efforts. The coordinated community-based approach prescribed in S. 1222 will set a powerful example for solving the more complicated environmental challenges ahead in the next century. It will also help refocus the Army Corps on the restoration of natural systems, just as is intended in the current draft of the Water Resources Development Act that is currently under consideration.

Because S. 1222 affects the Army Corps' mission and purpose, and because the health of America's estuaries cannot afford years of delay, we respectfully urge immediate consideration of S. 1222 as part of the WRDA reauthorization. We know this is a tall order but we believe strongly that the need justifies the request.

Your attention to my remarks today is appreciated very much. Thank you for allowing me the opportunity to share my perspective on why estuarine habitat restoration is so important for Narragansett Bay and the estuaries throughout the country that add so much to our coastal environment and heritage.

Senator CHAFEE. Thank you very much, Mr. Spalding. We appreciate that.

And now Dr. Burkholder. They have started this vote and I'll have to leave in about seven or 8 minutes, but we can get started. Why don't you proceed.

STATEMENT OF JOANN R. BURKHOLDER, RESEARCH COORDINATOR, BOTANY DEPARTMENT, NORTH CAROLINA STATE UNIVERSITY, RALEIGH, NC

Ms. BURKHOLDER. Thank you, Mr. Chairman. It is a great honor to be invited to speak before your committee. I would like to tell you that personally I have very much admired you for a long time and all your efforts.

Senator CHAFEE. Well, that's fine. Did everybody hear that?

[Laughter.]

Ms. BURKHOLDER. The litany of all the enormous values of our Nation's estuaries is familiar to many people of all ages. There are three basic reasons for my testifying here today. First, as a scientist knowledgeable in technical aspects of estuarine degradation, I am pleased to testify on behalf of these valuable resources and their enormous importance to all of us in this country. I've stressed to you the need to strengthen our understanding not only of obvious impacts from human influences, many of us know about floating garbage, but, of greater importance, the more insidious chronic impacts of our actions in degrading our estuaries.

Research from every coast of this country has shown, for example, that fish suffer higher incidents of bleeding sores, malignant tumors, loss of reproductive ability, and immune system suppression in estuarine waters near urban centers.

Senator CHAFEE. Dr. Burkholder, I'm afraid they have now gone to the last part. So we're going to recess for a few minutes. I'm not

sure, there may be a couple of votes back to back. But as soon as I get back, we will continue with you.

The committee will be in recess for a few minutes here.

[Recess.]

Senator CHAFEE. The committee will return to order.

I notice Senator Breaux is here. Senator Breaux has been deeply interested in these issues for many years. Senator, if you have some comments you would like to make, now is the chance.

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

Senator BREAUX. Thank you, Mr. Chairman, and thank the witnesses at the table for allowing me just to make a comment or two. First, I thought it was important to come and say congratulations to you for this effort. You've been a leader in this area as long as I have been around the Congress and working in these particular areas. I think this legislation, which I am very proud to be a cosponsor of, is extremely important.

When some people in the country think of estuarine areas, they think of marsh lands or wetlands and they don't really understand the productivity of these areas and how valuable they are, from two standpoints. They are valuable because they're part of our country and esoteric beauty that is found in estuarine areas is incredible and it is extremely important. Second, and equally as important, is the economic value of these areas. They are extremely valuable. Most of Louisiana is an estuarine area, my entire State practically. About 40 percent of the Nation's wetlands are found in my State, one State. We're also losing about 80 percent of all the wetlands in all of North America in my one State. So any legislation dealing with estuarine areas and wetland areas is incredibly important.

Just as a note for the record, the economic value of these areas in my own State of Louisiana is extremely significant. Wildlife and resources are estimated to bring almost $6 billion annually to the economy of my State. That's because we produce over 15 percent of the Nation's commercial fish harvest out of Louisiana. Without the estuarine areas, this could not happen. These are the breeding grounds for all of the fish resources——fin fish and shellfish——and things that are produced that ultimately end up in the Gulf of Mexico and ultimately end up all over the world. So without the estuarine areas as these nurseries, all of this would not occur.

So your Estuary Habitat Restoration Partnership Act, which is now before your committee, is extremely important. It is a very positive step, and 1 day, hopefully, we will be able to look back at this legislation as a key to ensuring the continued viability of these very important areas. I commend you for your action.

Senator CHAFEE. Thank you, Senator Breaux. I want to reciprocate by expressing our appreciation for your long work in this area because you've been a stalwart. We look forward to your continued support. Thank you.

Now, Dr. Burkholder, if you would be good enough to continue. I don't think there are going to be any more interruptions. Now that's said with not great certitude as far as votes go. I don't know, I think that we're good for a while anyway. So go to it.

STATEMENT OF JOANN R. BURKHOLDER, RESEARCH COORDINATOR, BOTANY DEPARTMENT, NORTH CAROLINA STATE UNIVERSITY, RALEIGH, NC—CONTINUED

Ms. BURKHOLDER. Thank you. There are three basic reasons for my testifying here today, as I mentioned. First, as a scientist, I would like to stress to you the need of strengthening our understanding not only of obvious impacts of human influences on our estuaries, but, of greater importance I think, more insidious and chronic impacts of our actions in degrading our estuaries.

As I was beginning to say earlier, research from every coast of this country has shown that fish suffer higher incidents of bleeding sores, malignant tumors, loss of reproductive ability, and immune system suppression in estuarine waters near urban centers. Such subtle and chronic impacts are likely much more serious to fish than an obvious fish kill that usually affects only a small number of fish relative to the total population size.

The chronic effects of our actions in degrading estuaries also extend beyond fish to our own health, as shown by the story of Pfiesteria. This microscopic toxic creature thrives in waters that are over-enriched from sewage, animal waste, lawn and cropland fertilizer, and other sources. People who breath the airborne toxins from Pfiesteria over waters where it is attacking fish can suffer from severe learning disabilities and memory loss for months afterwards. This provides just one example of the fact that estuarine water quality, fish health, and human health impacts can be strongly linked.

My second reason for speaking here today is to state my strong support for S. 1222 and also S. 1321. As a citizen who has been involved in policy recommendations about strengthening wise use of estuarine resources, I believe that the partnership cost-sharing approach that is outlined in S. 1222 will be highly constructive in bringing all stakeholders together, from industries and municipalities to individual citizens, in working to achieve major restoration of our estuaries.

Within this context, I envision four goals. First, we should accelerate river and watershed cleanup through a strong incentive program which is encouraged by S. 1222. This program should encompass both point and nonpoint source contributors. This effort must also target reestablishment of more natural flow patterns in watersheds to enhance pollutant filtering and breakdown rather than the ditching and channelization that deliver pollutants more directly to our rivers.

Development of strong water reuse programs will also help combat both pollution and salt imbalances created by coastal aquifer depletion. The phragmites problem and others are related to that. And we should work to expand coastal reserves in order to increase protection of fish nursery grounds.

The second goal that I envision is that we will need to improve and update resource inventories, hence my strong support for S. 1321 as well as S. 1222. This will really help us to establish baselines where they're not available so that we can mark our progress. For example, accurate maps of submersed aquatic vegetation, wetlands, shellfish beds, fish nursery and spawning grounds are needed in many regions.

Achievement of major estuarine restoration will also require additional tools that must be provided by research. For example, we need to develop improved indicators of chronic impacts of pollutants on key species in estuarine food webs, including young as well as adult stages. We will need improved techniques for increasing natural functions of both constructed and restored wetlands and seagrass meadows. We must improve our ability to create value-added products from our wastes rather than viewing them as materials to be discarded. And I think especially, and it is often overlooked, we need strengthened research in natural resource economics so that the full benefits of all the goods and services provided by estuaries can be both accurately valued and imparted to our citizens.

The third goal that I see is that we should work to strengthen enforcement of existing laws for estuarine resource conservation or wise use. Again, this needs to be accomplished hand-in-hand with development of strong incentive programs and also provision of support through development of innovative fundraising programs.

We also need to work to improve upon some legislation. For example, land use plans under the Coastal Area Management Act should be strengthened to require consideration of the ability of adjacent waters to handle the wastes that accompany our increasing coastal population growth. Currently, these land use plans do not contain that provision.

And fourth, we should work to promote development of comprehensive environmental education and outreach programs about the importance of good water quality and healthy habitats, such as wetlands and seagrass beds, both in estuaries and upstream in the watersheds that drain into them. These programs should begin in preschool, extend to high school and college, and continue to touch all citizens throughout their lives.

My third and final reason for speaking for to you is much simpler than the others——to help fishermen and other coastal folk who are a big part of my State and our country's heritage and also for our children in the battle for estuarine restoration and wise resource maintenance.

I am also very pleased to join you and especially to join my Senator, Senator Faircloth, on this issue. This committee and he have shown strong depth of caring for our estuaries and for all of us who depend upon them in our State and country in support of these bills. Thank you again for the privilege of addressing this Senate committee on this important issue.

Senator CHAFEE. Thank you very much, Dr. Burkholder. We appreciate that. I'm impressed by the number of papers that you've written and had a part in writing, as shown in the back of your testimony. Congratulations.

Ms. BURKHOLDER. Thank you.

Senator CHAFEE. Dr. Milon, professor, food and resource economics department, University of Florida, Gainesville. Welcome, Doctor.

STATEMENT OF J. WALTER MILON, PROFESSOR, FOOD AND RESOURCE ECONOMICS DEPARTMENT, UNIVERSITY OF FLORIDA, GAINESVILLE, FL

Mr. MILON. Thank you very much, Chairman Chafee. I thank you for the opportunity to present a brief summary of some research on the economic value of the Indian River Lagoon, an estuary of national significance and part of the Environmental Protection Agency's existing National Estuary Program. I come to you not so much as an advocate of any particular legislation, but more as, if you will, a reporter from the academic community about some research that this particular NEP program conducted and to give you some insights from that research.

This information is derived from a study I coordinated as part of a team organized by Apogee Research Inc., a nationally recognized leader in environmental and natural resource economics. This study was sponsored by the Indian River National Estuary Program and the St. Johns Water Management District, the State sponsor for the Indian River NEP. The study is presented as one documented example of the value of estuaries nationwide.

The Indian River Lagoon, one of the Nation's most biologically diverse estuaries, stretches 156 miles along Florida's east coast spanning Volusia, Brevard, Indian River, St. Lucie, and Martin counties. These five counties are home to more than 1 million residents and host more than 6 million visitors each year. The number of visitors in the five counties of the Lagoon is expected to increase from 1.25 million to almost 1.5 million between 1995 and 2005.

In developing estimates of the economic value of an environmental resource such as an estuary, it is important to consider the scope and extent of human activity related to that resource. I offer to you the accompanying Table 2–4 which is condensed from a much larger report which I've included as different addendums as part of my testimony here. That Table 2–4 is on page 16 of Addendum A, if you have an opportunity to look at that. The table shows the scope of activities which are considered in the Indian River Lagoon study. These activities range from traditional economic uses such as the value of commercial and recreational harvests from the Lagoon to more intangible economic values such as the enhancement of land values adjacent to the resource and individuals' values for preserving the resource. The full report, as I mentioned, presents the valuation methodologies and data collection used in the study, so I'm not going to describe those here.

These results that are summarized in Table 2–4 show the importance of the Lagoon to the economy of the region in 1995. Recreational fishing by residents and tourists was estimated to contribute approximately $340 million to the regional economy, swimming, boating, water sports, and nature observation activities around the Lagoon contributed another $287 million. Commercial harvesting of shellfish such as clams, oysters, and crabs contributed nearly $13 million annually. In addition, residential land values were enhanced by the presence of the Lagoon in the amount of approximately $825 million which can be expressed as an annualized value of about $33 million. Collectively, the direct values associated with the Lagoon on an annual basis amounted to more than $725 million.

The Lagoon-dependent activities create additional indirect impacts on the regional economy. Businesses related to recreation, tourism, and fisheries generate nearly $4 billion, or about 17 percent of total output within the region. And again, for this information I refer you to Addendum B, additional information that's provided in there. I'll leave that to whoever is interested in digging out the individual details on that. Resident and tourist spending for Lagoon-related activities accounted for more than 19,000 jobs in the region.

These measures of the economic contribution of the Indian River Lagoon can be compared to the costs of implementing the comprehensive conservation and management plan developed as part of the Indian River NEP. This comprehensive plan includes recommendations to maintain and restore the Lagoon through water quality management and habitat protection. These costs are estimated to be less than $18 million annually, indicating that the costs of sustaining the activities dependent on the Lagoon are modest relative to their economic contribution within the region.

Properly designed funding plans could spread these costs equitably so that the average citizen in the region would pay no more than $10 per year. In addition, public surveys conducted for this study showed that residents would be willing to pay more than three times the estimated annual cost to implement CCMP.

The results of the study, while limited to a single estuary, help to illustrate the economic importance of estuaries in regional economies and the linkage between environmental quality and economic development. The economy of the Indian River Lagoon region depends upon the ecosystem services provided by the estuary and future development within the region will be linked to adequate maintenance of the health of this ecosystem.

Studies such as the one I am reporting to you are an integral link in helping citizens and public officials understand the linkage between the health of the estuaries and local economies. On this score I refer you to a letter from the St. Johns River Water Management District which, as I mentioned, is the State sponsor for the Indian River NEP. In that letter they discuss their own thoughts on the legislation before you and also reiterate this point about the importance of studies dealing with the economic value of these resources. And as you and other members of the committee have pointed out, this kind of information is extremely important in building local support and local understanding of the role of these estuaries in the region, and for building political support, they are absolutely vital to the local citizenry.

I hope this information will be useful to the committee. I will gladly provide you with any details about this study or any other information about economic valuation of environmental resources that would assist the committee in its deliberations. Thank you.

Senator CHAFEE. Thank you very much, Dr. Milon. I think what's helpful to the others is the methodology that you used in arriving at your conclusions. I must say, it seems to me that you were modest and cautious in the land value figure you used, because certainly in our State there's a whale of a difference between somebody whose got an ocean or an estuary view from their property and someone who doesn't in the value of his or her land.

Mr. MILON. Yes. Part of what we were trying to do, as I mentioned, was to build this local support and, if you will, local credibility. We wanted in the study to use as many conservative assumptions as we could so that these valuation estimates, if you will, could not be challenged on the grounds that they were excessive. That in part led to some of that conservatism. But you're correct, the ratios are enormous between residential property in particular on waterfront which is obviously highly valuable relative to non-waterfront property, but also there's a difference between those areas that have very high water quality and those that have degraded water quality.

Senator CHAFEE. No question about that.

All right, Mr. Morton, counsel, Coastal and Ocean Program, American Oceans Campaign. Welcome.

STATEMENT OF TED MORTON, COUNSEL, COASTAL PROTECTION PROGRAM, AMERICAN OCEANS CAMPAIGN

Mr. MORTON. Good morning, Mr. Chairman. My name is Ted Morton. I am the Coastal Protection Program counsel for American Oceans Campaign which is a national, nonprofit organization dedicated to protecting and enhancing our Nation's oceans and coastal resources. On behalf of my organization and its members, I wish to express my thanks to Senators Chafee and Baucus and to the other members of the committee for inviting me to testify on legislative proposals to improve estuarine protections.

As you know, last year marked the 25th anniversary of the Nation's premier water quality law——the Clean Water Act. Across the Nation, communities used the anniversary to assess the condition of their lakes, streams, rivers, and coastal waters. Many communities discovered that significant progress had been achieved. However, 25 years after the passage of the Clean Water Act, we will have not achieved one of the Act's principal goals——to make all waters swimmable and fishable. Coastal waters are particularly troubled. A recent EPA report disclosed that about 38 percent of the Nation's surveyed estuaries are not clean enough to support basic uses such as fishing and swimming. In addition, estuarine habitat is threatened by unwise development, sedimentation, destructive fishing practices, and other threats.

In order to improve the state of estuaries, it is imperative to develop and follow a comprehensive national strategy that addresses water quality improvements, habitat restoration, public education efforts, and greater investments. I believe that a combination of Senator Chafee's Estuary Habitat Restoration Partnership Act, S. 1222, and Representatives Lowey, DeLauro, and Shays' Water Pollution Control and Estuary Restoration Act, H.R. 2374, provides a significant start to ensure that a comprehensive national strategy for estuarine protection is put in place.

The American Oceans Campaign joins other leading estuarine protection organizations across the Nation in support of the Estuary Habitat Restoration Partnership Act, the bill that Curtis Spalding has so eloquently discussed today. The bill would greatly improve efforts to restore estuarine habitats. In particular, I am very supportive of the call for the creation of a collaborative council that will direct a national estuarine habitat restoration strategy.

Rather than echo the comments of Senators, Curt, and others, I would like to spend much of my time discussing the National Estuary Program and H.R. 2374. Since the creation of the NEP in 1987, 28 nationally significant estuaries have been the focus of intense study and planning. Community leaders in these particular estuaries have collaboratively crafted comprehensive estuarine management plans, called CCMPs, that are designed to restore their local estuary. Seventeen of the twenty-eight estuaries have approved CCMPs and local communities are hard at work to implement their plans. However, most communities are finding implementation a challenge.

H.R. 2374, the Lowey, DeLauro, Shays bill, corrects the most glaring weakness of the National Estuary Program——the lack of consistent, adequate Federal funds to assist States and localities in implementing approved estuary plans. This bill is very similar to bills introduced in the Senate in previous years by Senators Lieberman, Moynihan, D'Amato, and Dodd.

The Lowey, DeLauro, Shays bill will strengthen protections for estuaries by requiring implementation of approved estuarine management plans. It assures a more sizable and dependable Federal funding source for NEP implementation activities. The bill increases authorization levels for the Clean Water State Revolving Loan Fund to $2.5 billion in fiscal year 1998, gradually increasing this level to $4 billion in fiscal year 2004. The bill requires that States with approved estuarine plans set aside a percentage of the SRF increases for implementing approved plans.

To be part of the National Estuary Program an estuary is determined to be nationally significant. It should therefore be in the national interest to ensure that plans to restore these waters are fully implemented. The Lowey, DeLauro, Shays bill, by establishing a dependable source of Federal funds to help States implement CCMPs, substantially advances efforts to clean estuaries and restore estuarine habitat.

The NEP is also the focus of the National Estuary Conservation Act, S. 1321, introduced by Senator Torricelli. S. 1321 allows NEP grants to be used to develop and implement CCMPs and increases authorized levels for the NEP to $50 million a year. Senator Torricelli's bill is a stride in the right direction. However, the bill could potentially create additional hurdles for the NEP. First, the annual Federal allocation of $50 million to be divided among 28 programs for both planning and implementation purposes is not a sufficient level to ensure substantial progress in implementing priority actions of CCMPs.

Second, the bill could create conflicts between newer programs still developing their CCMPs and older programs needing funds for implementation. Just as current authorizations for the NEP are routinely targeted for earmarks, it is highly likely that the additional funds will also be earmarked for special estuarine projects, thereby squeezing dollars from programs still developing their plans.

Finally, I'm concerned that with additional NEP grant dollars available, EPA might succumb to pressure to use portions of the increased authorizations to add new local programs rather than fund implementation of existing ones.

In conclusion, it is time for the United States to establish a comprehensive national strategy for estuarine protection. The beginnings of a strategy are already in place. Local estuarine programs of the NEP have identified numerous priority actions needed for cleaning estuaries and restoring habitats. In addition, coastal communities, States, and nonprofits like Save the Bay and Chesapeake Bay Foundation have initiated successful estuarine habitat restoration projects and have identified several more projects needing immediate attention.

I encourage this committee to mark up a comprehensive estuarine protection bill that includes both the Chafee and the Lowey, DeLauro, Shays bill. This comprehensive bill would foster beneficial estuarine habitat restoration activities, augment efforts to minimize water quality impairment from both polluted runoff and point sources, encourage broad-scale meaningful public participation, and increase Federal financial contributions to ensure estuaries will remain special productive places in the future.

I appreciate the opportunity to testify today and look forward to your questions. Thank you.

Senator CHAFEE. Thank you very much, Mr. Morton.

One of the problems that comes up constantly is nonpoint source pollution, particularly with agricultural runoff, which I think you touched on, Dr. Burkholder, and others have likewise. What can we do about that, Dr. Burkholder? We don't want to get in a conflict with the farmers and yet there's no question but the agricultural runoff is a very serious thing. I think Mr. Spalding touched on it, too. Got any suggestions?

Ms. BURKHOLDER. I think that we should develop some very strong incentive programs we have not developed in the past, and also we need to enforce the legislation we already have in place to try to control nonpoint pollution. Often when we try to enforce it, we find that we haven't really given the polluters the recourse to be able to follow best management practices or the existing laws.

So, as I mentioned earlier, I think we need not only to enforce the legislation that we have, but also to develop much better incentive programs that are backed by appropriate funding for, for example, the little farmers in the middle of a concentrated animal operation situation to be able to do better in handling waste.

Senator CHAFEE. I think handling the waste is one thing. In other words, you talked about incentives. I suppose a form of incentive would be to help contribute to the farmers to build some holding ponds of some type. That's OK for the waste to attempt to control the waste. But what do you do with the fertilizer that they put on their fields, the pesticides and so forth, plus the manure that they scatter on their fields which they done from time immemorial?

Ms. BURKHOLDER. Again, there are a lot of things that are being tried right now in my own State. One is to do much better in trying to figure out how to make value-added products of the wastes so, instead of spraying them or putting them on fields, we can market them in some way. The current practices that we have, for all their best intentions, often still treat wastes just as wastes, so there has to be somewhere to put them, somewhere to get rid of them and waters have always been a repository.

So we need much, much more innovative methods to turn these into value-added products. Some of those technique applications and research efforts are being tried but they need a lot more support. A lot of the research that I talked about I don't even do, so it's certainly not anything that would benefit my laboratory but it is research that would benefit the country because we have such a burgeoning problem with animal wastes in certain areas and with urban runoff as well.

There should be other incentives that we can try. Tax incentives are commonly done and there are some innovative funding things that we could do that. For instance in my State, we don't even have an environmental license plate like some States do. So, some very easy things that would really help to get some funding into these sorts of programs could be done.

Senator CHAFEE. Any thoughts, Mr. Spalding?

Mr. SPALDING. Yes, I do, Senator. One of the best examples of an approach for dealing with nonpoint source pollution comes from your home State, in fact in a city you're familiar with. The city of Warwick ran something called the Greenwich Bay Initiative. Greenwich Bay was suffering severely from nonpoint pollution——failing septic systems, farms, those sorts of things——and through a comprehensive watershed approach, they've done great things. It was demonstrated this past month. We've had this unbelievable amount of rain in Rhode Island, as you know, and nonpoint pollution closed the beaches all the way down the Bay. Well, Greenwich Bay's beaches came back much faster than people thought and I think in large part because of the work that had been done there on a watershed basis.

Buffer zones can be built. Restoration of marshes can be part of that strategy in the long run, because marshes have the capacity to filter pollutants coming off of farms and open spaces such as golf courses and parks. In our Rhode Island context, we don't have nearly the farmland they have in North Carolina. So with a watershed approach that is accountable——it's very important for all of us to remember we've got to meet the goals and objectives. You can't say let's just plan, plan, plan and not get things done.

Senator CHAFEE. I think one of the things they did in that Greenwich Bay was also to provide assistance to those who had poor septic systems, didn't they?

Mr. SPALDING. Absolutely right. Several innovative ideas such as wastewater management districts. In fact, we used some EPA support to connect people to existing interceptors. In that situation you had sewer lines that people were not connecting to. So there's a number of opportunities.

The big solution though was that there was a farm that was a problem. They pinpointed it and gave assistance to the farmer; dealt with some waste management problems, and also worked on a long term acquisition strategy with this farmer so that his land can stay open but also be better managed.

Senator CHAFEE. OK. Thank you all very, very much. Dr. Milon, I'm familiar with your area. My father-in-law for years and years sent us oranges from Indian River.

Mr. MILON. Indian River Lagoon. Yes, that's the same one.

Senator CHAFEE. Indian River Orchards. So I look on Indian River with great favorability.

[Laughter.]

Senator CHAFEE. Thank you all very much.

Now we'll have Panel III, Mr. Xavier Romeu and Dr. Juan Martınez-Cruzado.

Mr. Romeu, welcome. And I believe you have the Majority Leader of the Senate with you.

Mr. ROMEU. Yes, Mr. Chairman. I would like the Majority Leader of the Senate of Puerto Rico to accompany me.

Senator CHAFEE. Maybe you could just introduce him.

Mr. ROMEU. Charles Rodriquez is the President of the Senate of Puerto Rico who has travelled here specifically on the particular legislation before the committee.

Senator CHAFEE. Fine. Thank you. Glad you're here. I understand that you had to go to particular effort to get here because of the strike you're having down there in Puerto Rico.

Mr. ROMEU. Everything is under control, Senator.

Senator CHAFEE. Good. OK. Proceed, if you would.

STATEMENT OF XAVIER ROMEU, EXECUTIVE DIRECTOR, PUERTO RICO FEDERAL AFFAIRS ADMINISTRATION, ON BEHALF OF PERFECTO OCASIO, EXECUTIVE DIRECTOR, PUERTO RICO AQUEDUCT AND SEWER AUTHORITY, SAN JUAN, PR; ACCOMPANIED BY: HON. CHARLES A. RODRIQUEZ, PRESIDENT, SENATE OF PUERTO RICO AND HAGUB SHAHABIAN, ENGINEER

Mr. ROMEU. Good morning, Mr. Chairman and members of the committee. My name is Xavier Romeu. I am the executive director of the Puerto Rico Federal Affairs Administration, essentially known as the Office of the Governor of Puerto Rico in the continental United States. I appear before you today on behalf of the Puerto Rico Aqueduct and Sewer Authority, better known as PRASA, the public corporation that serves almost all of the 3.8 million American citizens in Puerto Rico with portable water and wastewater services. PRASA's executive director, Perfecto Ocasio, as has been noted, was unable to travel last night. Please excuse his unforeseen unavoidable absence from this important hearing.

We appreciate your understanding and willingness to consider our views. I thank you for giving me the opportunity to comment on the need for this legislation which would benefit the environment and the economy of Puerto Rico. Also with me is Dr. Hagub Shahabian, a distinguished engineer with an expertise in hydrology and wastewater treatment issues.

First, I would like to present to the committee a letter from Governor Pedro Rossello urging quick Senate action on H.R. 2207, as a matter of urgent importance to the people of Puerto Rico. I understand also that Congressman Romero- Barcelo has submitted a letter of support for the record. As you know, Congressman Barcelo was instrumental in passing this legislation in the House. He could not attend the hearing today due to prior engagements which required his presence also in Puerto Rico.

Under Section 301(h) of the 1977 Clean Water Act, coastal communities, including islands, were given the opportunity to apply for

an alternative to the requirements of secondary treatment for ocean discharges that met stringent environmental equivalency requirements. All applications were initially required to be submitted to the EPA by December 31, 1982. PRASA submitted seven applications. Of those seven, six were tentatively approved; only one, the Mayaguez treatment plant outfall, was denied finally in 1994. The application was rejected because of the location of the outfall in the sensitive coral environment of Mayaguez Bay.

H.R. 2207, passed by the House last October, would allow Puerto Rico to apply to the EPA for authority under Section 301(h) of the Clean Water Act to construct a new, state-of-the-art deep ocean outfall at a location that avoids this sensitive coral environment of Mayaguez Bay. This would be an alternative to secondary treatment at the current outfall location in Mayaguez Bay.

This option is specifically embodied, as was noted before, in a recent Consent Decree between the EPA and PRASA, which resolves essentially a 15 year old legal dispute. The Consent Decree, supported by EPA and PRASA, requires PRASA to meet a detailed schedule for the construction of facilities necessary to achieve compliance with all of the requirements of the Clean Water Act.

As is known, the Decree provides two alternatives. One is the construction of a traditional secondary treatment plant, at a high cost and energy consumption, which will continue to discharge effluents into the Mayaguez Bay. The second alternative, illustrated in the accompanying chart, is the construction of a deep water ocean outfall sending primary treated effluents several miles offshore into deep ocean currents, thus relieving the stress on the Bay and its sensitive coral ecosystems. The deep water outfall would be less expensive to build and much less expensive to operate than a secondary treatment plant. EPA would determine whether the deep ocean outfall meets all Clean Water standards. However, because of the urgent need for a solution, the Consent Decree permits EPA consideration of the outfall alternative only if Congress authorizes the approach by August 1, 1998. Therefore time is of the essence.

The current legislation provides Puerto Rico the same opportunity that Congress has given other coastal communities in unique situations to implement Section 301(h). The bill does not in any way change any applicable standards of the Clean Water Act. Without authority to submit a waiver application to the EPA, PRASA may be required to spend millions of dollars for a secondary treatment plant that will have no beneficial effect on the stressed marine environment of Mayaguez Bay. These funds could be used for the renovation and upgrade of Puerto Rico's water facilities infrastructure and other water supply treatment and wastewater projects urgently needed in the island of Puerto Rico.

Indeed, just last month, the President issued an Executive Order on Coral Reef Protection. The legislation also provides Congress and the EPA with an early opportunity to further the goals of this initiative. That order which is designed to protect and preserve coral reef ecosystems requires all Federal agencies to use their authorities to reduce impact on affected environments from pollution and sedimentation. H.R. 2207 will allow EPA the opportunity to determine whether a deep ocean outfall can protect the Bay.

Without this bill, EPA and PRASA have no options except an immediate and inordinately expensive one, a course of action that would continue pollution and sedimentation of the coral ecosystem. This bill does not authorize construction of a deep ocean outfall. It will simply allow us to conclude the necessary studies and complete an application for EPA review.

Indeed, PRASA is already proceeding to ensure a thorough environmental review of all options under Law No. 9, Puerto Rico's local equivalent of the National Environment Policy Act. PRASA and the Puerto Rico Environment Quality Board are preparing an environmental impact statement. A draft EIS was completed in April recommending a deep ocean outfall as environmentally preferable. A copy of the EIS is being submitted to the committee. The entire EIS record will be available to EPA as it considers the strict standards of Section 301(h).

There are precedents for limited amendment to Section 301(h). The Municipal Wastewater Treatment Construction Grant amendments of 1981 included a provision that specifically permitted the city of Avalon, California to file. The 1981 provision concluded, "Failure to broaden eligibility risks requiring treatment for treatment's sake involving the expenditure of funds which would better be used to achieve additional water quality benefits elsewhere." This bill does not grant variances. It simply allows variances to be sought with the burden on the applicant to make his case on environmental grounds.

The Water Quality Act of 1987 also included a specific provision for the Irvine Ranch Water District, a California public agency, that permitted the district to file for a Section 301(h) waiver. More recently, in 1994, Congress passed H.R. 5176, which allowed the city of San Diego to apply for a waiver under Section 301(h) within 180 days of enactment. This action precisely parallels the provision here.

The Government of Puerto Rico urges the committee to act quickly. A legislative solution must be in place before August 1, 1998. This will allow us to put to rest years of litigation and focus our energies and capital resources on implementing an environmentally sound solution for Mayaguez and other urgent priorities.

Mr. Chairman, this concludes my statement. I thank you for your time and consideration of this important issue for Puerto Rico.

Senator CHAFEE. Thank you very much for that testimony.

Now, Dr. Juan Martínez-Cruzado.

STATEMENT OF JUAN C. MARTINEZ-CRUZADO, PAST PRESIDENT, MAYAGUEZANOS FOR HEALTH AND ENVIRONMENT, INC., ON BEHALF OF ROBERTO PEREZ-COLON, PRESIDENT, MUNICIPAL ASSEMBLY OF MAYAGUEZ, MAYAGUEZ, PR

Mr. MARTINEZ-CRUZADO. Good morning, Mr. Chairman.

Senator CHAFEE. Good morning.

Mr. MARTINEZ-CRUZADO. I am Dr. Juan Carlos Martínez-Cruzado, former president of and spokesperson for Mayaguezanos for Health and Environment. We thank this committee very much for this opportunity to express our views to you even though we are not constituents of any of you. I am giving my testimony on behalf of the Mayor of the city of Mayaguez, Mayaguezanos for Health

and Environment, and a Legal Cologica de Rincon. We prepared one copy of this package for each member of this committee. It includes our testimonies, a letter of support from most of the major environmental groups here on the mainland, and other important materials. My statement will differ a little bit from the written testimony.

In Mayaguez, we hold our Bay in very high regard and dream of the day in which we may be able again to swim in it without skin rashes, ear infections, and other ailments. We must stress for the record that the history of EPA in Puerto Rico and the Virgin Islands is categorized by indifference and negligence and a much less pro-environmental position than is generally the case on the mainland. The agency's handling of 301(h) waivers is a very good example.

Since that provision was——

Senator CHAFEE. Doctor, could I hold up 1 minute here. I want to make certain I have your testimony. I lost you there. Are you speaking from this testimony that you submitted?

Mr. MARTINEZ-CRUZADO. I submitted that testimony on behalf of Mayaguezanos for Health and Environment. The problem is that Victor Negrone, from the Council of the city of Mayaguez——

Senator CHAFEE. Yes, I've got a copy of the Mayor's letter here.

Mr. MARTINEZ-CRUZADO. I am speaking on behalf of both.

Senator CHAFEE. But I was just trying to get what you were working from. OK. I think I have it here. Go ahead, please.

Mr. MARTINEZ-CRUZADO. Thank you. We must address for the record that the history of EPA in Puerto Rico and the Virgin Islands is characterized by indifference and negligence and a much less pro-environmental position than is generally the case on the mainland. The agency's handling of 301(h) waivers is a very good example. Since that provision was first added to the Act in 1977, more than 200 applications for waivers were submitted. EPA has made its final determinations on all but seven of those applications. Not coincidentally, the remaining seven are all in Puerto Rico or the Virgin Islands. In the meantime, partially treated sewage continues to be dumped into the Caribbean and the Atlantic.

As Hispanics, we are very aware of discrimination by EPA. So we were very pleased that President Clinton signed an Executive Order on Environmental Justice in 1993. However, the problem remains a very real one for us. After all, we do not believe that there has ever been any other Consent Decree but that of Mayaguez in which EPA agrees to sit on the law for 1 year explicitly to give the defendant a chance to weaken the law that EPA is called on to enforce. We cannot, and we do not, trust EPA.

Because of the Mayaguez sewage treatment plant's noncompliance, EPA has imposed a moratorium on new sewer hookups. This is depressing our economy. There is a deficit of new housing that has been built in Mayaguez since 1993. Because of this, there is a dire need for low and middle income housing in our municipality. Many persons have moved away to nearby towns, thereby affecting our economy.

Even though EPA concluded 7 years ago——seven years ago—— that the water of Mayaguez Bay was already so stressed and no further impairment could be tolerated, PRASA is still discharging

the same barely treated wastewater at the same site and causing the same effects on our beaches and corals. Tourism along the entire Bay coastline is the lowest in 10 years. No seaside recreational development has occurred in the past 10 years. The city's own plans to develop a promenade along the beachfront have been postponed due to the water's dirty appearance and foul smell. This has stymied our efforts to replace decreasing industrial employment opportunities with tourist related jobs.

And here we are now considering turning the clock back to 1979 and giving PRASA another opportunity to engage in a long 301(h) waiver application procedure. The people of Mayaguez, who are sick of waiting for action, can only regard this bill as an excuse to keep doing nothing about the sewage in Mayaguez, and an attempt to condemn our city and our corals to a slow death.

The people's desire for a quick solution to this discharge is so great that even the Governor of Puerto Rico went out of his way in October 1996 1 month before the general elections to promise to the people of Mayaguez the start of the construction of a secondary treatment plant by July last year. That promise, however, proved to be an empty one.

Last May PRASA prepared an environmental impact statement for the deep ocean outfall. PRASA put in writing and on the map the proposed point and depth of discharge. The depth is 400 feet, not 600, and it is within, not under, the pignocline, suggesting that the wastewaters will float to the surface rather than stay in the depths.

Hence, the proposed discharge will impact the beaches of Rincon and Anyasco to the North, well known as tourists spots for the surfing activities, as well as a major coral reef that will be located a mile from the point of discharge. The discharge will be very close to the point where the continental shelf drops off. This area provides critical habitat to massive populations of fish larvae and is thus a cornerstone of the local fishery. As a result, opposition to this bill is quickly growing in all sections of society in the neighboring municipalities of Anyasco and Rincon.

The statement made by EPA that they believe that a discharge will occur at a depth of 600 feet threatens our belief that this application will eventually be denied. Twelve years of sewer hook-up moratorium and almost raw sewage being discharged within our Bay so that this mediocre solution may be considered smells like very bad business for Mayaguez.

On the other hand, an engineering company has made public a proposal for secondary treatment followed with discharge to existing wetlands for natural tertiary treatment. Land application of secondarily treated wastewater will be less expensive than deep ocean disposal and will remove all discharges from the sea.

It is crystal clear that the deep ocean outfall is the worst possible solution to a fairly straightforward problem. When Congress structured its 301(h) waiver opportunity in 1977, they did it so with the clear understanding that the opportunity to seek such waiver would expire in 5 years. In other words, even where a sewage plant operator can persuade EPA that it complies with all of the criteria found in the law, no application for such a waiver could be accepted after December 31, 1982. On that day, the door closed. Why? Be-

cause Congress recognized that there is something profoundly wrong with dumping barely treated waste into the sea. On this, the 92d Congress' idea turns out to be right. The 105th Congress will make a grave mistake by reopening that door.

If the bill is not enacted, secondary treatment will be in operation by 2001 according to the terms of the Consent Decree. Even though secondary treatment may not provide full relief to corals, it is a step toward a tertiary treatment which will provide adequate protection for the reefs. More importantly, it will permit lifting of the sewer hook-up moratorium that is depressing the economy of Mayaguez.

We urge you please to let H.R. 2207 die. Thank you.

Senator CHAFEE. Well, thank you very much, Doctor.

Now as I understand, Dr. Martınez-Cruzado, what Mr. Romeu and others are saying is that they just want the opportunity to apply for the waiver to EPA. If I understood correctly, that seemed to be what the proposition was. Now what's the matter with that, just letting PRASA make the application?

Mr. MARTINEZ-CRUZADO. The main problem is time. It took EPA 12 years to deny PRASA's application for Mayaguez, from 1979 to 1991. If this bill is approved, if this application goes through, we may very well expect 12 more years of the application procedure. Those are 12 more years there will be the moratorium on the sewer hook-up and 12 more years of this sewage being discharged right in front of our corals with barely treated sewage. That is totally unacceptable for us. It is really a matter of time. We understand a secondary treatment will make it much better and will be a right step to our tertiary treatment which will provide adequate protection for the corals.

Senator CHAFEE. I will put in the record here the letter from the mayor, Mayor Rodriguez, written July 6, addressed to me. And then he had some testimony that he submitted and we'll put that in the record, too.

[The referenced letter and testimony of Mayor Rodriguez follow:]

Senator CHAFEE. Now, isn't there a Consent Decree that PRASA is meant to go to a secondary treatment by 2001, Doctor?

Mr. MARTINEZ-CRUZADO. That is unless this bill passes. If this bill passes, it opens the door for a 301(h) waiver application, and in that case it does not have to construct the secondary treatment plant by October 31. And I was very distressed to see in the written testimony of EPA today, they didn't read it but it is in the written testimony, that they are very short of resources to look at this 301(h) waiver application, if this bill is approved. They recognize there are corals off the Bay and that they will have to analyze it in light of the recent Clinton Executive Order on Coral Reef Protection. So that is telling us they are already giving excuses for how long they will take to analyze this proposal which, in fact, we find has quite a few weaknesses.

So we are very worried that this application, if it ever happens, will take very easily 12 more years. And we are not willing to wait for that long. Our economy is depressed. We are losing millions of dollars, and I speak at this time for the city of Mayaguez, and we are not willing to go through that again.

Mr. ROMEU. Senator?

Senator CHAFEE. Mr. Romeu, what do you say to the argument that Dr. Martınez-Cruzado has made that this is a delaying action? As I understand, you've applied twice before for waivers and have been turned down both times. And now you want to get special permission to try again. What's the answer to that?

Mr. ROMEU. Senator, the Government of Puerto Rico expects to move expeditiously in this area. In fact, the legislature of Puerto Rico has passed a concurrent resolution which I believe has been furnished to the members of the committee.

Also, I would like to make two quick comments. There are at least two assumptions in the testimony of my colleague. One is that the secondary treatment plant will be a much better situation than the one that we are proposing. And we propose that it is for the EPA to make that decision, not for the committee, very respectfully. The other one is that the secondary treatment plant will be built by December 2001. There is no guarantee of that and, in fact, the testimony of an EPA official before me seemed to cast doubt on the feasibility of that.

So on both counts, on the quality of the alternative, and the timeliness of what the Government of Puerto Rico intends to do, I believe that my colleague is incorrect. In any event, I believe that that is a determination to be made by the EPA which will review the waiver application fully and will make a determination.

Senator CHAFEE. If I understand, his arguments are that this thing can be dragged out forever. I guess your colleague mentioned a 12 year period that this has gone on.

Mr. ROMEU. We have no such intention. And as a good faith show that we do not have that intention, we have already prepared an environmental impact statement, as I mentioned previously in my testimony.

With the Senator's permission, can the Senator of the Senate of Puerto Rico make a brief statement for the record?

Senator CHAFEE. Sure. But it has to be rather brief. If he would like to, fine. Step right up to the table.

STATEMENT OF HON. CHARLES A. RODRIGUEZ, PRESIDENT, SENATE OF PUERTO RICO

Mr. RODRIGUEZ. Good morning, Mr. Chairman, and thank you very much. For the record, my name is Charles Rodriguez. I am the President of the Senate of Puerto Rico.

Senator CHAFEE. We welcome a fellow Senator. Who can keep a fellow Senator from making a few remarks.

Mr. RODRIGUEZ. Thank you, Mr. Chairman. In the Senate of Puerto Rico, we are very much concerned with the situation that is occurring in the West Coast of Puerto Rico. The city of Mayaguez, the municipalities of Ormegueros, Cabal Rojo, and Anyasco have their economic rebuilding totally in halt because of this problem we have with the water treatment plant. That is the reason we have been supporting this alternative before you in this legislation, because we believe that at least it gives the opportunity to submit to the EPA this alternative which they will have to review, and they will review it to see that it will satisfy the environmental requirements that EPA will obviously be seeking for it to be implemented with this alternative.

We want to see this passed through because we in the Puerto Rican Senate are going to be overseeing our local public corporation to see that, if this is approved and the EPA goes on to approve this alternative also of the deep water ocean outfall, we will be obviously overseeing the process. We are willing even to be submitted to a timetable that EPA may well introduce in its authorization of the construction of this alternative. And we will see that it is complied with.

So I must say that, as the U.S. Senate does and the other senates of the 50 States, the Senate of the Territory of Puerto Rico will be overseeing this and looking to see that the construction of this project becomes a reality, because we have to deal with the problem of the West Coast of Puerto Rico and we have this pledge to the people of that part of the island.

Senator CHAFEE. Fine. All right, concluding statement. Go ahead, Dr. Martınez-Cruzado.

Mr. MARTINEZ-CRUZADO. Well, as has been said, this will depend on how fast EPA analyzes this. And EPA has said that it is short of resources. I really don't want to put EPA in a position where it will be pressed to approve a proposal that puts the discharge in the pignocline where it may surface. We are very much concerned that this either would take a long, long time, or that it will take some time and bring to a solution that is unacceptable and that the discharge treated will float and impact the corals.

So we are really getting into a box here that it is not good at all. We understand that there is already a Consent Decree in the Federal court and it says there has to be the secondary treatment plant operational by December 31, 2001. Operational. There are fines to be put in place if it is not. But that goes only if this bill dies.

Senator CHAFEE. All right. Fine. Thank you all very much. We appreciate your coming all the way up from Puerto Rico. We'll try to move quickly on this.

That concludes the hearing.

[Whereupon, at 11:53 a.m., the committee was adjourned, to reconvene at the call of the chair.]

[The texts of S. 1222, S. 1321, H.R. 2207, and statements submitted for the record follow:]

II

105TH CONGRESS
1ST SESSION

S. 1222

To catalyze restoration of estuary habitat through more efficient financing of projects and enhanced coordination of Federal and non-Federal restoration programs, and for other purposes.

IN THE SENATE OF THE UNITED STATES

SEPTEMBER 25, 1997

Mr. CHAFEE (for himself, Mr. BREAUX, Mr. LIEBERMAN, Mr. FAIRCLOTH, Mr. ROBB, Mr. SARBANES, Mr. D'AMATO, Mrs. MURRAY, Mr. MURKOWSKI, Mr. WARNER, Mr. REED, Ms. LANDRIEU, Mr. GRAHAM, Ms. MIKULSKI, Mr. DODD, Mr. MOYNIHAN, and Mr. MACK) introduced the following bill; which was read twice and referred to the Committee on Environment and Public Works

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A BILL

To catalyze restoration of estuary habitat through more efficient financing of projects and enhanced coordination of Federal and non-Federal restoration programs, 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. SHORT TITLE.

This Act may be cited as the "Estuary Habitat Restoration Partnership Act of 1997".

SEC. 2. FINDINGS.

Congress finds that—

(1) the estuaries and coastal regions of the United States are home to half the population of the United States;

(2) the traditions, economy, and quality of life of many communities depend on the natural abundance and health of the estuaries;

(3) approximately 75 percent of the commercial fish and shellfish of the United States depend on estuaries at some stage in their life cycle;

(4) the varied habitats of estuaries and other coastal waters provide jobs to 28,000,000 United States citizens in commercial and sport fishing, tourism, recreation, and other industries, with fishing alone contributing $111,000,000,000 to the United States economy each year;

(5) despite the many values of estuaries, estuaries are gravely threatened by estuary habitat alteration and loss;

(6) the accumulated loss of estuary habitat, reaching over 90 percent in some estuaries, threatens the ecological and economic bounty of regions experiencing the loss, and can be reversed only by action to restore lost and degraded estuary habitat;

(7) the demands on Federal, State, and local funding for estuary habitat restoration activities exceed available resources and prompt serious concerns about the ability of the United States to restore estuary habitat vital to efforts to restore, preserve, and protect the health of estuaries;

(8) successful restoration of estuaries demands the full coordination of Federal and State estuary habitat restoration programs;

(9) to succeed in restoring estuaries, it is important to link estuary habitat restoration projects to broader ecosystem planning in order to establish restoration programs that are effective in the long term;

(10) efficient leveraging of scarce public resources and new and innovative market-based funding for estuary habitat restoration activities would generate real returns on investments for communities through improvement of the vibrancy and health of estuaries;

(11) the Federal, State, and private cooperation in estuary habitat restoration activities in existence on the date of enactment of this Act should be strengthened and new public and public-private estuary habitat restoration partnerships established; and

(12) such new partnerships would help ensure the ecological and economic vibrancy of estuaries for the benefit of future generations.

SEC. 3. PURPOSES.

The purposes of this Act are—

(1) to establish a voluntary, community-driven, incentive-based program that will catalyze the restoration of 1,000,000 acres of estuary habitat by 2010;

(2) to encourage enhanced coordination and leveraging of Federal, State, and community estuary habitat restoration programs, plans, and studies;

(3) to establish effective estuary habitat restoration partnerships among public agencies at all levels of government and between the public and private sectors;

(4) to promote efficient financing of estuary habitat restoration activities to help better leverage limited Federal funding; and

(5) to develop and enhance monitoring and maintenance capabilities designed to ensure that restoration efforts build on the successes of past and current efforts and scientific understanding.

SEC. 4. DEFINITIONS.

In this Act:

(1) COLLABORATIVE COUNCIL.—The term "Collaborative Council" means the interagency council established by section 5.

(2) DEGRADED ESTUARY HABITAT.—The term "degraded estuary habitat" means estuary habitat where natural ecological functions have been impaired and normal beneficial uses have been reduced.

(3) ESTUARY.—The term "estuary" means—

(A) a body of water in which fresh water from a river or stream meets and mixes with salt water from the ocean; and

(B) the physical, biological, and chemical elements associated with such a body of water.

(4) ESTUARY HABITAT.—

(A) IN GENERAL.—The term "estuary habitat" means the complex of physical and hydrologic features and living organisms within estuaries and associated ecosystems.

(B) INCLUSIONS.—The term "estuary habitat" includes salt and fresh water coastal marshes, coastal forested wetlands and other coastal wetlands, tidal flats, natural shoreline areas, shellfish beds, sea grass meadows, kelp beds, river deltas, and river and stream banks under tidal influence.

(5) ESTUARY HABITAT RESTORATION ACTIVITY.—

(A) IN GENERAL.—The term "estuary habitat restoration activity" means an activity that results in improving degraded estuary habitat (including both physical and functional restoration), with the goal of attaining a self-sustaining, ecologically based system integrated into the surrounding landscape.

(B) INCLUDED ACTIVITIES.—The term "estuary habitat restoration activity" includes—

(i) the reestablishment of physical features and biological and hydrologic functions;

(ii) except as provided in subparagraph (C)(ii), the cleanup of contamination;

(iii) the control of nonnative and invasive species;

(iv) the reintroduction of native or ecologically beneficial species through planting or natural succession; and

(v) other activities that improve estuary habitat.

(C) EXCLUDED ACTIVITIES.—The term "estuary habitat restoration activity" does not include—

(i) an act that constitutes mitigation for the adverse effects of an activity regulated or otherwise governed by Federal or State law; or

(ii) an act that constitutes satisfaction of liability for natural resource damages under any Federal or State law.

(6) ESTUARY HABITAT RESTORATION PROJECT.—The term "estuary habitat restoration project" means an estuary habitat restoration activity under consideration or selected by the Collaborative Council, in accordance with this Act, to receive financial, technical, or another form of assistance.

(7) ESTUARY HABITAT RESTORATION STRATEGY.—The term "estuary habitat restoration strategy" means the estuary habitat restoration strategy developed under section 6(a).

(8) FEDERAL ESTUARY MANAGEMENT OR HABITAT RESTORATION PLAN.—The term "Federal estuary management or habitat restoration plan" means

any Federal plan for restoration of degraded estuary habitat that—

(A) was developed by a public body with the substantial participation of appropriate public and private stakeholders; and

(B) reflects a community-based planning process.

(9) PERSON.—The term ''person'' includes an entity of a Federal, State, or local government, an Indian tribe, an entity organized or existing under the law of a State, and a nongovernmental organization.

(10) SECRETARY.—The term ''Secretary'' means the Secretary of the Army, or a designee.

(11) UNDER SECRETARY.—The term ''Under Secretary'' means the Under Secretary for Oceans and Atmosphere of the Department of Commerce, or a designee.

SEC. 5. ESTABLISHMENT OF COLLABORATIVE COUNCIL.

(a) COLLABORATIVE COUNCIL.—There is established an interagency council to be known as the ''Estuary Habitat Restoration Collaborative Council''.

(b) MEMBERSHIP.—The Collaborative Council shall be composed of the Secretary, the Under Secretary, the Administrator of the Environmental Protection Agency,

the Secretary of the Interior (acting through the Director of the United States Fish and Wildlife Service), the Secretary of Agriculture, and the Secretary of Transportation, or their designees.

(c) CONVENING OF COLLABORATIVE COUNCIL.—The Secretary shall—

(1) convene the first meeting of the Collaborative Council not later than 30 days after the date of enactment of this Act; and

(2) convene additional meetings as often as appropriate to ensure that this Act is fully carried out, but not less often than quarterly.

(d) COLLABORATIVE COUNCIL PROCEDURES.—

(1) QUORUM.—Three members of the Collaborative Council shall constitute a quorum.

(2) VOTING AND MEETING PROCEDURES.—The Collaborative Council shall establish procedures for voting and the conduct of meetings by the Council.

SEC. 6. DUTIES OF COLLABORATIVE COUNCIL.

(a) ESTUARY HABITAT RESTORATION STRATEGY.—

(1) IN GENERAL.—

(A) DEVELOPMENT.—Not later than 1 year after the date of enactment of this Act, the Collaborative Council, in consultation with representatives from coastal States and nonprofit

organizations with expertise in estuary habitat restoration, shall develop an estuary habitat restoration strategy designed to ensure a comprehensive approach to the selection and prioritization of estuary habitat restoration projects and the full coordination of Federal and non-Federal activities related to restoration of estuary habitat.

(B) PROVISION OF NATIONAL FRAMEWORK.—The estuary habitat restoration strategy shall provide a national framework for estuary habitat restoration activities by—

(i) identifying existing estuary habitat restoration plans;

(ii) integrating overlapping estuary habitat restoration plans; and

(iii) identifying appropriate processes for the development of estuary habitat restoration plans where needed.

(2) INTEGRATION OF PREVIOUSLY AUTHORIZED ESTUARY HABITAT RESTORATION PLANS, PROGRAMS, AND PARTNERSHIPS.—In developing the estuary habitat restoration strategy, the Collaborative Council shall—

(A) conduct a review of—

(i) Federal estuary management or habitat restoration plans; and

(ii) Federal programs established under other law that provide funding for estuary habitat restoration activities;

(B) develop, based on best management practices, a framework for fully coordinating and streamlining the activities of the Federal plans and programs referred to in subparagraph (A);

(C) develop a set of proposals for—

(i) using programs established under this or any other Act to maximize the incentives for the creation of new public-private partnerships to carry out estuary habitat restoration projects; and

(ii) leveraging Federal resources to encourage increased private sector involvement in estuary habitat restoration activities; and

(D) ensure that the estuary habitat restoration strategy is developed and will be implemented in a manner that is consistent with the findings and requirements of Federal estuary management or habitat restoration plans.

(3) ELEMENTS TO BE CONSIDERED.—Consistent with the requirements of this section, the Collaborative Council, in the development of the estuary habitat restoration strategy, shall consider—

(A) the contributions of estuary habitat to—

(i) wildlife, including endangered and threatened species, migratory birds, and resident species of an estuary watershed;

(ii) fish and shellfish, including commercial and sport fisheries;

(iii) surface and ground water quality and quantity, and flood control;

(iv) outdoor recreation; and

(v) other areas of concern that the Collaborative Council determines to be appropriate for consideration;

(B) the estimated historic losses, estimated current rate of loss, and extent of the threat of future loss or degradation of each type of estuary habitat;

(C) the most appropriate method for selecting estuary habitat restoration projects essential to—

(i) the proper protection and preservation of an estuary ecosystem;

(ii) the implementation of a Federal estuary management or habitat restoration plan; or

(iii) the selection by the Collaborative Council of an appropriate balance of smaller and larger estuary habitat restoration projects; and

(D) procedures to minimize duplicative and conflicting application requirements for public and private landowners seeking assistance for estuary habitat restoration activities.

(4) COMMUNITY ADVICE.—The Collaborative Council shall seek the advice of experts in restoration of estuary habitat from the private, including nonprofit, sectors to assist in the development of an estuary habitat restoration strategy.

(5) PUBLIC REVIEW AND COMMENT.—Before adopting a final estuary habitat restoration strategy, the Collaborative Council shall publish in the Federal Register a draft of the estuary habitat restoration strategy and provide an opportunity for public review and comment.

(b) ESTABLISHMENT OF PROJECT APPLICATION AND SELECTION CRITERIA.—

(1) IN GENERAL.—Consistent with the other provisions of this section, the Collaborative Council shall establish—

(A) application procedures to be followed by States and other non-Federal persons to nominate estuary habitat restoration activities for consideration by the Collaborative Council for assistance under this Act;

(B) criteria for determining eligibility for financial assistance under this Act for an estuary habitat restoration project;

(C) application procedures and criteria for granting a reduction in the minimum non-Federal share requirement, in accordance with section 7(d)(2); and

(D) such other criteria as the Collaborative Council determines to be reasonable and necessary in carrying out this Act.

(2) PROPOSALS.—A proposal for an estuary habitat restoration project shall originate from a non-Federal person and shall require, when appropriate, the approval of State or local agencies.

(3) FACTORS TO BE TAKEN INTO ACCOUNT.—The criteria established under paragraph (1) shall provide for the consideration of the following factors in determining the eligibility of an estuary habitat restoration project for financial assistance under this Act and in prioritizing the selection of estuary habitat restoration projects by the Collaborative Council:

(A) Whether the proposed estuary habitat restoration project meets the criteria specified in the estuary habitat restoration strategy.

(B) The technical merit and feasibility of the proposed estuary habitat restoration project.

(C) Whether the non-Federal persons proposing the estuary habitat restoration project can provide satisfactory assurances that they will have adequate personnel, funding, and authority to carry out and properly maintain the estuary habitat restoration project.

(D) Whether, in the State in which a proposed estuary habitat restoration project is to be carried out, there is a State dedicated source of funding for programs to acquire or restore estuary habitat, natural areas, and open spaces.

(E) Whether the proposed estuary habitat restoration project will encourage the increased coordination and cooperation of Federal, State, and local Government agencies.

(F) The level of private matching fund or in-kind contributions to the estuary habitat restoration project.

(G) Whether the proposed habitat restoration project includes a monitoring plan to ensure that short-term and long-term restoration goals are achieved.

(H) Other factors that the Collaborative Council determines to be reasonable and necessary for consideration.

(4) PRIORITY ESTUARY HABITAT RESTORATION PROJECTS.—

(A) DESIGNATION.—The Collaborative Council may designate an estuary habitat restoration project as a priority estuary habitat restoration project if, in addition to meeting the selection criteria specified in this section—

(i) the estuary habitat restoration project addresses a restoration goal identified in the estuary habitat restoration strategy;

(ii) the estuary habitat restoration project is part of an approved Federal estuary management or habitat restoration plan;

(iii) the non-Federal share with respect to the estuary habitat restoration project exceeds 50 percent; or

(iv) there is a nonpoint source program upstream of the estuary habitat restoration project that addresses upstream sources that would otherwise re-impair the restored habitat.

(B) EFFECT OF DESIGNATION.—A priority estuary habitat restoration project shall be given a higher priority in receipt of funding under this Act.

(c) INTERIM ACTIONS.—

(1) IN GENERAL.—Pending completion of the estuary habitat restoration strategy developed under subsection (a), the Collaborative Council may pay the Federal share of the cost of an interim action to carry out an estuary habitat restoration activity.

(2) FEDERAL SHARE.—The Federal share shall not exceed 25 percent.

(d) COOPERATION OF NON-FEDERAL PARTNERS.—

(1) IN GENERAL.—The Collaborative Council shall not select an estuary habitat restoration project until each non-Federal interest has entered into a written cooperation agreement in accordance with section 221(a) of the Flood Control Act of 1970 (42 U.S.C. 1962d–5b(a)).

(2) MAINTENANCE AND MONITORING.—A cooperation agreement entered into under paragraph (1) shall provide for maintenance and monitoring of the estuary habitat restoration project to the extent determined necessary by the Collaborative Council.

(e) LEAD COLLABORATIVE COUNCIL MEMBER.—The Collaborative Council shall designate a lead Collaborative Council member for each proposed estuary habitat restoration project. The lead Collaborative Council member shall have primary responsibility for overseeing and assisting others in implementing the proposed project.

(f) AGENCY CONSULTATION AND COORDINATION.—

(1) IN GENERAL.—In carrying out this section, the Collaborative Council shall consult with, cooperate with, and coordinate its activities with the activities of other appropriate Federal agencies, as determined by the Collaborative Council.

(2) USE OF COORDINATING MECHANISMS.—The Collaborative Council shall work to ensure that Fed-

eral agency coordinating and streamlining mechanisms established under other law are fully used in cases in which the Collaborative Council determines the use of the mechanisms to be appropriate.

(g) BENEFITS AND COSTS OF ESTUARY HABITAT RESTORATION PROJECTS.—The Collaborative Council shall evaluate the benefits and costs of estuary habitat restoration projects in accordance with section 907 of the Water Resources Development Act of 1986 (33 U.S.C. 2284).

(h) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated to the Department of the Army for the administration and operation of the Collaborative Council $4,000,000 for each fiscal year.

SEC. 7. COST SHARING OF ESTUARY HABITAT RESTORATION PROJECTS.

(a) IN GENERAL.—No financial assistance in carrying out an estuary habitat restoration project shall be available under this Act from any Federal agency unless the non-Federal applicant for assistance demonstrates to the satisfaction of the Collaborative Council that the estuary habitat restoration project meets—

(1) the requirements of this Act; and

(2) any criteria established by the Collaborative Council under this Act.

(b) FEDERAL SHARE.—

(1) IN GENERAL.—Except as provided in paragraph (2), for each fiscal year, the Federal share of the cost of an estuary habitat restoration project assisted under this Act shall be not less than 25 percent and not more than 65 percent.

(2) INCREASED FEDERAL SHARE.—In the case of an estuary habitat restoration project with respect to which the applicant demonstrates need under subsection (d)(2), the Federal share of the cost of the project shall not exceed 75 percent.

(c) PAYMENT OF FEDERAL SHARE UNDER OTHER LAW.—The Collaborative Council may use funds made available under this Act to pay all or part of the Federal share of the cost of an estuary habitat restoration activity eligible for funding under a program established under another provision of law, if the activity would also be eligible for funding under this Act as an estuary habitat restoration project.

(d) NON-FEDERAL SHARE.—

(1) IN-KIND CONTRIBUTIONS.—The non-Federal share of the cost of an estuary habitat restoration project may be provided in the form of land, easements, rights-of-way, services, or any other form of in-kind contribution determined by the Collabo-

rative Council to be an appropriate contribution equivalent to the monetary amount required for the non-Federal share of the estuary habitat restoration project.

(2) REDUCED NON-FEDERAL SHARE.—An applicant for assistance in carrying out an estuary habitat restoration project may submit an application for a reduction in the requirement of the payment of a non-Federal share of at least 35 percent, if the applicant submits a statement of need and demonstrates a need for a reduced non-Federal share in accordance with section 103(m) of the Water Resources Development Act of 1986 (33 U.S.C. 2213(m)).

(e) ALLOCATION OF FUNDS BY STATES TO POLITICAL SUBDIVISIONS.—With the approval of the Secretary, a State may allocate to any local government, area wide agency designated under section 204 of the Demonstration Cities and Metropolitan Development Act of 1966 (42 U.S.C. 3334), regional agency, or interstate agency, a portion of any funds disbursed by the Collaborative Council to the State for the purpose of carrying out an estuary habitat restoration project.

SEC. 8. MONITORING AND MAINTENANCE OF ESTUARY HABITAT RESTORATION PROJECTS.

(a) DATABASE OF RESTORATION PROJECT INFORMATION.—The Under Secretary shall maintain an appropriate database of information concerning estuary habitat restoration projects funded by the Collaborative Council, including information on project techniques, project completion, monitoring data, and other relevant information.

(b) REPORT.—

(1) IN GENERAL.—The Collaborative Council shall biennially submit a report to the Committee on Environment and Public Works of the Senate and the Committee on Transportation and Infrastructure of the House of Representatives on the results of activities carried out under this Act.

(2) CONTENTS OF REPORT.—A report under paragraph (1) shall include—

(A) data on the number of acres of estuary habitat restored under this Act, including the number of projects approved and completed that comprise those acres;

(B) the percentage of restored estuary habitat monitored under a plan to ensure that short-term and long-term restoration goals are achieved;

(C) an estimate of the long-term success of varying restoration techniques used in carrying out estuary habitat restoration projects;

(D) a review of how the Collaborative Council has incorporated the information described in subparagraphs (A) through (C) in the selection and implementation of estuary habitat restoration projects;

(E) a review of efforts made by the Collaborative Council to maintain an appropriate database of restoration projects funded under this Act; and

(F) a review of the measures that the Collaborative Council has taken to provide the information described in subparagraphs (A) through (C) to persons with responsibility for assisting in the restoration of estuary habitat.

SEC. 9. MEMORANDA OF UNDERSTANDING.

In carrying out this Act, the Collaborative Council may—

(1) enter into cooperative agreements with persons; and

(2) execute such memoranda of understanding as are necessary to reflect the agreements.

SEC. 10. DISTRIBUTION OF APPROPRIATIONS FOR ESTUARY HABITAT RESTORATION ACTIVITIES.

The Secretary shall allocate funds made available to carry out this Act based on the need for the funds and such other factors as the Collaborative Council determines to be appropriate to carry out this Act.

SEC. 11. AUTHORIZATION OF APPROPRIATIONS.

(a) AUTHORIZATIONS OF APPROPRIATIONS UNDER OTHER LAW.—Funds authorized to be appropriated under section 908 of the Water Resources Development Act of 1986 (33 U.S.C. 2285) and section 206 of the Water Resources Development Act of 1996 (33 U.S.C. 2330) may be used by the Secretary in accordance with this Act to assist States and other non-Federal persons in carrying out estuary habitat restoration projects or interim actions under section 6(c).

(b) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary to carry out this Act—

(1) $40,000,000 for fiscal year 1999;

(2) $50,000,000 for fiscal year 2000; and

(3) $75,000,000 for each of fiscal years 2001 through 2003.

SEC. 12. GENERAL PROVISIONS.

(a) ADDITIONAL AUTHORITY FOR ARMY CORPS OF ENGINEERS.—The Secretary—

(1) may carry out estuary habitat restoration projects as determined by the Collaborative Council; and

(2) shall give estuary habitat restoration projects the same consideration (as determined by the Collaborative Council) as projects relating to irrigation, navigation, or flood control.

(b) INAPPLICABILITY OF CERTAIN LAW.—Sections 203, 204, and 205 of the Water Resources Development Act of 1986 (33 U.S.C. 2231, 2232, 2233) shall not apply to an estuary habitat restoration project selected in accordance with this Act.

(c) ESTUARY HABITAT RESTORATION MISSION.—The Secretary shall establish restoration of estuary habitat as a primary mission of the Army Corps of Engineers.

(d) FEDERAL AGENCY FACILITIES AND PERSONNEL.—

(1) IN GENERAL.—Federal agencies may cooperate in carrying out scientific and other programs necessary to carry out this Act, and may provide facilities and personnel, for the purpose of assisting the Collaborative Council in carrying out its duties under this Act.

(2) REIMBURSEMENT FROM COLLABORATIVE COUNCIL.—Federal agencies may accept reimburse-

ment from the Collaborative Council for providing services, facilities, and personnel under paragraph (1).

(e) COLLABORATIVE COUNCIL ADMINISTRATIVE EXPENSES AND STAFFING.—Not later than 180 days after the date of enactment of this Act, the Comptroller General of the United States shall submit to Congress and the Secretary an analysis of the extent to which the Collaborative Council needs additional personnel and administrative resources to fully carry out its duties under this Act. The analysis shall include recommendations regarding necessary additional funding.

(f) APPLICATION OF AND CONSISTENCY WITH OTHER LAWS.—Except as specifically provided in this Act—

(1) nothing in this Act supersedes or modifies any Federal law in existence on the date of enactment of this Act; and

(2) each action by a Federal agency under this Act shall be carried out in a manner that is consistent with such law.

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II

105TH CONGRESS
1ST SESSION

S. 1321

To amend the Federal Water Pollution Control Act to permit grants for the national estuary program to be used for the development and implementation of a comprehensive conservation and management plan, to reauthorize appropriations to carry out the program, and for other purposes.

IN THE SENATE OF THE UNITED STATES

OCTOBER 28, 1997

Mr. TORRICELLI (for himself, Mr. GRAHAM, Mr. MACK, Mr. SARBANES, and Mr. LAUTENBERG) introduced the following bill; which was read twice and referred to the Committee on Environment and Public Works

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A BILL

To amend the Federal Water Pollution Control Act to permit grants for the national estuary program to be used for the development and implementation of a comprehensive conservation and management plan, to reauthorize appropriations to carry out the program, 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. NATIONAL ESTUARY PROGRAM.

(a) GRANTS.—Section 320(g) of the Federal Water Pollution Control Act (33 U.S.C. 1330(g)) is amended by

striking paragraphs (2) and (3) and inserting the following:

"(2) PURPOSES.—Grants under this subsection shall be made to pay for assisting activities necessary for the development and implementation of a comprehensive conservation and management plan under this section.

"(3) FEDERAL SHARE.—The Federal share of a grant to any person (including a State, interstate, or regional agency or entity) under this subsection for a fiscal year—

"(A) shall not exceed—

"(i) 75 percent of the annual aggregate costs of the development of a comprehensive conservation and management plan; and

"(ii) 50 percent of the annual aggregate costs of the implementation of the plan; and

"(B) shall be made on condition that the non-Federal share of the costs are provided from non-Federal sources.".

(b) AUTHORIZATION OF APPROPRIATIONS.—Section 320(i) of the Federal Water Pollution Control Act (33 U.S.C. 1330(i)) is amended by striking "$12,000,000 per

fiscal year for each of fiscal years 1987, 1988, 1989, 1990, and 1991" and inserting "$50,000,000 for each of fiscal years 1999 through 2004".

(c) EFFECTIVE DATE.—The amendments made by this section take effect on October 1, 1998.

fiscal year for each of fiscal years 1987, 1988, 1989, 1990, and 1991" and inserting "$50,000,000 for each of fiscal years 1999 through 2004".

(c) EFFECTIVE DATE.—The amendments made by this section take effect on October 1, 1998.

105TH CONGRESS
2D SESSION

H. R. 2207

IN THE SENATE OF THE UNITED STATES

JANUARY 27, 1998

Received; read twice and referred to the Committee on Environment and Public Works

AN ACT

To amend the Federal Water Pollution Control Act concerning a proposal to construct a deep ocean outfall off the coast of Mayaguez, Puerto Rico.

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

SECTION 1. SHORT TITLE.

This Act may be cited as the "Coastal Pollution Reduction Act of 1997".

SEC. 2. MAYAGUEZ, PUERTO RICO.

(a) FINDINGS.—Congress makes the following findings:

(1) The existing discharge from the Mayaguez publicly owned treatment works is to the stressed waters of Mayaguez Bay, an area containing severely degraded coral reefs, and relocation of that discharge to unstressed ocean waters could benefit the marine environment.

(2) The Federal Water Pollution Control Act should, consistent with the environmental goals of the Act, be administered with sufficient flexibility to take into consideration the unique characteristics of Mayaguez, Puerto Rico.

(3) Some deep ocean areas off the coastline of Mayaguez, Puerto Rico, might be able to receive a less-than-secondary sewage discharge while still maintaining healthy and diverse marine life.

(4) A properly designed and operated deep ocean outfall off the coast of Mayaguez, Puerto Rico, coupled with other pollution reduction activities in the Mayaguez Watershed could facilitate compliance with the requirements and purposes of the

Federal Water Pollution Control Act without the need for more costly treatment.

(5) The owner or operator of the Mayaguez publicly owned treatment works should be afforded an opportunity to make the necessary scientific studies and submit an application proposing use of a deep ocean outfall for review by the Administrator of the Environmental Protection Agency under section 301(h) of the Federal Water Pollution Control Act.

(b) APPLICATION FOR SECONDARY TREATMENT WAIVER FOR MAYAGUEZ, PUERTO RICO, DEEP OCEAN OUTFALL.—Section 301 of the Federal Water Pollution Control Act (33 U.S.C. 1311) is amended by adding at the end the following:

"(q) APPLICATION FOR WAIVER.—

"(1) STUDY.—In order to be eligible to apply for a waiver under this section, the owner or operator of the Mayaguez, Puerto Rico, publicly owned treatment works shall transmit to the Administrator a report on the results of a study of the marine environment of coastal areas in the Mayaguez area to determine the feasibility of constructing a deep ocean outfall for the Mayaguez treatment works. In conducting the study, the owner or operator shall consider variations in the currents, tidal movement,

and other hydrological and geological characteristics at any proposed outfall location. Such study may recommend one or more technically feasible and environmentally acceptable locations for a deep ocean outfall intended to meet the requirements of subsection (h). Such study may be initiated, expanded, or continued not later than 3 months after the date of the enactment of this subsection.

"(2) SECTION 301(h) APPLICATION FOR MAYAGUEZ, PUERTO RICO.—Notwithstanding subsection (j)(1)(A), not later than 18 months after the date of the enactment of this subsection, an application may be submitted for a modification pursuant to subsection (h) of the requirements of subsection (b)(1)(B) by the owner or operator of the Mayaguez, Puerto Rico, publicly owned treatment works at a location recommended in a study conducted pursuant to paragraph (1). Such application shall not be subject to the application revision procedures of section 125.59(d) of title 40, Code of Federal Regulations. No such application may be filed unless and until the applicant has entered into a binding consent decree with the United States that includes, at a minimum, the following:

"(A) A schedule and milestones to ensure expeditious compliance with the requirements of subsection (b)(1)(B) in the event the requested modification is denied, including interim effluent limits and design activities to be undertaken while the application is pending.

"(B) A schedule and interim milestones to ensure expeditious compliance with the requirements of any modification of subsection (b)(1)(B) in the event the requested modification is approved.

"(C) A commitment by the applicant to contribute not less than $400,000 to the Mayaguez Watershed Initiative in accordance with such schedules as may be specified in the consent decree.

"(3) INITIAL DETERMINATION.—On or before the 270th day after the date of submittal of an application under paragraph (2) that has been deemed complete by the Administrator, the Administrator shall issue to the applicant a tentative determination regarding the requested modification.

"(4) FINAL DETERMINATION.—On or before the 270th day after the date of issuance of the tentative determination under paragraph (3), the Ad-

ministrator shall issue a final determination regarding the modification.

"(5) ADDITIONAL CONDITION.—The Administrator may not grant a modification pursuant to an application submitted under this subsection unless the Administrator determines that the new deep water ocean outfall will use a well-designed and operated diffuser that discharges into unstressed ocean waters and is situated so as to avoid discharge (or transport of discharged pollutants) to coral reefs, other sensitive marine resources or recreational areas, and shorelines.

"(6) EFFECTIVENESS.—If a modification is granted pursuant to an application submitted under this subsection, such modification shall be effective only if the new deepwater ocean outfall is operational on or before the date that is 4½ years after the date of the Administrator's initial tentative determination on the application.".

SEC. 3. NATIONAL ESTUARY PROGRAM.

(a) GRANTS FOR COMPREHENSIVE CONSERVATION AND MANAGEMENT PLANS.—Section 320(g)(2) of the Federal Water Pollution Control Act (33 U.S.C. 1330(g)(2)) is amended by inserting "and implementation" after "development".

(b) AUTHORIZATION OF APPROPRIATIONS.—Section 320(i) of such Act (33 U.S.C. 1330(i)) is amended by striking "1987" and all that follows through "1991" and inserting the following: "1987 through 1991, such sums as may be necessary for fiscal years 1992 through 1997, and $20,000,000 for fiscal year 1998".

Passed the House of Representatives November 13, 1997.

Attest: ROBIN H. CARLE,
Clerk.

STATEMENT OF HON. LAUCH FAIRCLOTH, U.S. SENATOR FROM THE STATE OF NORTH CAROLINA

S. 1222, THE ESTUARY HABITAT RESTORATION ACT

Two years ago, the North Carolina Coastal Federation asked me to support what is now S. 1222, the Estuary Habitat Restoration Act. I understand that Melvin Shepard, the president of the Coastal Federation is here today. Melvin, I hope you'll let the folks back in Nor& Carolina know what I'm about to say.

Although I have spent a good part of my life in and around the coastal sounds and rivers of North Carolina, until I started looking at the merits of this bill I did not fully realize just how important these waters are to my State and the nation.

We've got 2.2 million acres of estuaries in North Carolina. Our commercial and recreational fishing industry is dependent upon these waters. More than 90 percent of North Carolina's commercially important species of fish and shellfish spend part of their lives in the state's estuaries.

I'm also proud to say that nearly 50 percent of the seafood caught on the east coast of the United States depends on North Carolina's estuaries. In short, our ability to have seafood in this nation depends upon main healthy and productive coastal waters.

This bill will enable communities to get to work restoring degraded estuaries across this country.

It is vital that we target needed resources to restore and preserve our Nation's estuaries. The goal of the bill is ambitious—to restore one million acres of estuarine habitat by the year 2010. We want to restore 100,000 acres in North Carolina alone.

S. 1222 sets out new, innovative ways of making this happen. It will help our communities restore habitat critical to preserving our nation's estuaries.

The bill also is important because it sets out a new way of building genuine partnerships between our communities, our states and the Federal Government.

It makes sure that we listen to our citizens; build from what we know; coordinate and streamline existing programs; and most important, target limited resources in a cost-effective manner.

The level of support the bill has received speaks well of the potential value of the legislation to so many American coastal communities, and says a great deal about the stature of Senator Chafee, as chairman of the Senate Environment and Public Works Committee, and of his work on behalf of the environment.

I am committed to working with you, Mr. Chairman, committee members, and fellow cosponsors to move S. 1222 this year.

Mr. Chairman, I would respectfully suggest that we move this estuary bill as a part of the Water Resources Development Act reauthorization, to ensure that it gets done this year.

I believe this would make sense since the estuary bill makes the Army Corps of Engineers the lead agency in estuary restoration.

We need to make sure S. 1222 is a part of the reauthorization. If we don't, a good bill—one that builds bipartisan bridges as it restores our estuaries—will get devoured in the larger and much more charged debate about the Clean Water Act next year.

Lastly, I wish to welcome Dr. Joann Burkholder of N.C. State University, who will be testifying here today. Dr. Burkholder is well known to most of you as one of the nation's leading research scientists, and is one of the discoverers of the Pfiesteria microbe. She will be testifying to the serious consequences which can flow from degraded estuaries. Joann, it's good to have you here.

Thank you, Mr. Chairman.

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

I'd like to thank the Chairman of the committee, Senator John Chafee, for this opportunity to address the committee and I am pleased to join him at today's hearing on the "Estuary Habitat Restoration Partnership Act of 1997." I want to commend him for his leadership on this issue. I also appreciate the 25 other Senators who have joined us as co-sponsors of this bill so that we may draw national attention to the significant value of the Nation's estuaries and the need to restore them.

This bill seeks to create a voluntary, community driven, incentive-based program which builds partnerships between Federal, state and local governments and the private sector to restore estuaries, including sharing in the cost of restoration projects.

Some relevant and eye-opening statistics about estuaries which have been published include:

• 75 percent of commercial fish and shellfish which are harvested in the U.S. and 80–90 percent of the recreational fish catch depend upon estuary habitat at some life stage.

• The rapid and significant loss of estuary habitat, reaching over 90 percent in some areas, threatens the commercial and sport fishing industries, tourism, recreation, and other industries. These industries provide jobs to about 28 million U.S. citizens. Fishing alone contributes $111 billion to the U.S. economy per year.

• In my own State of Louisiana, fish and wildlife resources are estimated to bring $5.7 billion into the economy yearly. Louisiana's coast produces 16 percent of the commercial harvest fisheries in the U.S.

• 40 percent of the wild fur harvest in the U.S. comes from Louisiana's wetlands.

With estuaries and coastal regions being home to about half of the U.S. population, and with coastal counties growing 3 times faster than counties elsewhere, it is obvious that the ecological and economic impact of estuary losses must be taken seriously and must be addressed.

In Louisiana, our estuaries, such as the Ponchartrain, Barataria-Terrebonne, and Vermilion Bay systems are vital to the culture and economy of local communities. When the Acadian people migrated to Louisiana in the 1700's, they settled there because of the abundance of natural resources along its coastal wetlands. The lifestyle and jobs of many Louisianians continues to be centered around these resources, which are as much a part of its culture as its economy.

I am proud:

• that Louisiana has been at the forefront of the movement to recognize the importance of estuaries and to propose legislation to restore them, in particular the Coalition to Restore Coastal Louisiana.

• that the Barataria-Terrebonne Estuary is one of 28 estuaries in the National Estuary Program.

• of the advanced level of the work Louisiana is conducting in its coastal areas, including the development and implementation of a federally approved coastal wetlands conservation plan.

It is time now for Congress to implement a strategy whereby public and private partnerships may be used to ensure that estuaries remain ecologically and economically vibrant for future generations through restoration projects.

Mr. Chairman, in conclusion, I again want to thank you for your leadership and look forward to working with you and other Senators on this critical piece of environmental legislation. Because estuaries are an important national resource, bringing real dollars to our economy and affecting the lives, the safety, and the well-being of people all over this nation, I am hopeful that the Congress will move in a timely manner to authorize an effective estuary restoration program which will result in healthy and viable ecosystems.

STATEMENT OF HON. MARY L. LANDRIEU, U.S. SENATOR FROM THE STATE OF LOUISIANA

Thank you, Mr. Chairman. I appreciate the opportunity to comment today on an important measure before the Committee on Environment and Public Works—S. 1222, "The Estuary Habitat Restoration Partnership Act of 1997."

This significant legislation recognizes the cultural and economic importance of estuary habitats as a natural resource. We have learned from the past that protective measures are not enough. In addition to protection we must emphasize the education and restoration of estuary habitats. By creating Federal/State partnership programs I believe this bill is a major step in the right direction toward ensuring a sustainable resource base for the future.

In Louisiana alone we are home to one of the nation's largest productive estuaries, the Barataria/Terrebonne estuary, which covers over four million acres. Estuaries are the building blocks for the coastal areas of my State. From a wildlife and fisheries standpoint estuaries contribute nearly $6 billion to Louisiana's economy. In addition, they provide nursery grounds for fisheries across the Gulf of Mexico. Finally, estuaries are the basis for a growing industry, ecotourism. For these and other reasons coordinated efforts are vital to the continued viability of our nation's coastlines.

Thank you, Mr. Chairman.

STATEMENT OF HON. ROBERT G. TORRICELLI, U.S. SENATOR FROM THE STATE OF NEW JERSEY

Thank you Chairman Chafee for the opportunity to appear before the committee and for your cosponsorship of S. 1321. I would also like to thank Senators Lauten-

berg, Moynihan, Graham, Lieberman, and Boxer for their cosponsorship of the bill as well.

Today we stand at a crossroads in our national coastal policy. After years of Federal involvement, we are becoming lax in maintaining a consistent level of investment in our nation's coastlines.

Our coasts are an integral part of our national infrastructure. As we approach the next century, we must treat them like our roads, schools, and technology, as the foundation of economic development, job creation, and current prosperity.

Since the creation of the Beach and Erosion Board in the 1 930's the Federal Government has taken an active role in preserving our beaches.

Yet the Administration sees things differently and has even ignored the intent of Congress on the Federal role established 12 years ago.

Even though the 1986 Water Resources Development Act established the current funding format where the Federal Government pays 65 percent of beach replenishment projects, the Administration's 1998 proposal turned the relationship on its head by reducing the Federal share to 35 percent of the renourishment phase (which is typically 80–85 percent of the project cost.)

Beach replenishment is but one example of the lapse of the Federal commitment to our coastline. I trust the Committee, with the help of the senior Senator from New Jersey, will rectify this issue as they consider the Water Resources Development Act.

However, at this hearing we are examining another equally important issue—our nation's estuaries.

Estuaries are important to the economy for their fish and wildlife habitat as well as providing centers for boating and recreational activity.

Seventy-five percent of the U.S. commercial fish catch depends on estuaries.

New Jersey is the leading supplier of surf clams in the Nation with one of our most productive clam grounds located in Barnegat Bay estuary.

Our nation's coasts are also a central element of the tourism industry which nationally employs 14.4 million people and contributes over 10 percent to our GDP, making it the second-largest sector in the economy.

In New Jersey, fishing, boating, and outdoor recreation are important components of our $25 billion tourist economy.

A million fishermen participate in New Jersey's's marine recreational fishery.

With all this economic activity, in addition to land development and associated activities it is obvious that, our estuaries are heavily used resources under severe environmental pressures.

Over 400,000 people live in the Barnegat Bay estuary; in the summer that number doubles to 800,000.

There are 1 16 marinas and boat launching sites in the Barnegat Bay estuary where one third of New Jersey's boats are registered.

The popularity of Barnegat Bay has caused non-point source pollution from runoff and storm water discharges resulting in blooms of brown tide algae in 1995, 1997, and as recently as last month.

In other estuaries, intense urban development has resulted in major pollution sources. There are 730 Combined Sewage Overflows in New York-New Jersey Harbor that will take $2–6 billion to correct.

With all of these pressures, Congress recognized the importance of developing a program that would help states and localities plan for their protection and restoration.

The 1987 Clean Water Act Amendments established the National Estuary Program (NEP) which created a Federal partnership with state and local governments to prepare comprehensive management plans for estuaries of national significance threatened by pollution.

Over the years 28 estuaries were designated with 3 in New Jersey.

The Federal Government would provide funds while the state and local governments developed the plans.

Seventeen of the 28 designated estuaries have completed plans.

However, the NEP has not been reauthorized since 1991, and today the states cannot receive Federal funding to implement their plans.

The premise behind S. 1321 is simple: the Federal Government must continue to support those who have developed plans but are no longer eligible for Federal assistance.

In reauthorizing the NEP at $50 million annually, S. 1321 also includes the authority to make grants for plan implementation so those with completed plans can receive assistance as well as those who are still developing them.

S. 1321 would insure that the Federal Government lives up to its commitment to make investments to protect our nationally significant estuaries.

Mr. Chairman, I want to again thank you for your cosponsorship of S. 1321 as well as for your sponsorship of S. 1222, the Estuary Habitat Restoration Partnership Act.

Your support of these bills as well as the Committee's efforts in holding hearings today on coastal pollution reduction and estuary conservation demonstrate your commitment to solving these problems. I look forward to working with you and the Committee on these important legislative initiatives.

STATEMENT OF ROBERT H. WAYLAND III, DIRECTOR, OFFICE OF WETLANDS, OCEANS AND WATERSHEDS, OFFICE OF WATER, ENVIRONMENTAL PROTECTION AGENCY

Good morning, I am Robert H. Wayland, Director of the Office of Wetlands, Oceans, and Watersheds (OWOW) of the Environmental Protection Agency (EPA). These hearings come at a propitious time. The United States is observing the International Year of the Ocean and examining our responsibilities as stewards of ocean and coastal resources. At the recent National Oceans Conference in Monterey, the President committed to a series of actions in recognition of those responsibilities and again pledged the Administration to implement, with assistance from the Congress, a Clean Water Action Plan. This Plan, undertaken in recognition of the progress made and challenges remaining after a quarter century of implementing the Clean Water Act, contains numerous actions directed to marine and estuarine protection and restoration. These actions have been significantly influenced by our experience over the last decade in implementing the National Estuary Program.

The National Estuary Program, modeled after the Chesapeake Bay and Great Lakes Programs, was established by Congress in 1987 to demonstrate a new framework to address serious environmental problems faced by these valuable ecosystems. Estuaries are particularly vulnerable because they often serve as "sinks" for pollutants originating upstream within the watersheds and the airsheds overlying them. In addition, estuaries are directly impacted by human activity—well over half the people in this country live, work, or play near the coast.

The NEP seeks to protect and restore the health of estuaries and their living resources, and in so doing, the recreation, fishing, and other economic activities that take place in or depend on healthy estuaries. Just how valuable these activities are is highlighted by these facts and figures:

- Coastal waters support 28.3 million jobs and generate $54 billion in goods and services every year.
- The coastal recreation and tourism industry is the second largest employer in the nation, serving 180 million Americans visiting the coasts every year.
- The commercial fish and shellfish industry is also very important, contributing $45 billion to the economy every year, while recreational fishing contributes $30 billion to the U.S. economy annually.
- 39.6 percent of the Nation's classified marine shellfish areas are in NEP estuaries. 53.4 percent of those have limits on harvesting.
- 15 percent of the population of the continental US resides within NEP coastal watersheds.
- 26 percent of the 2.23 million square miles of watershed area of the US drains into NEP estuaries.
- Surface water covers 27,858,000 square miles of the Nation. NEPs cover 45 percent of that total, or 12,516,00 square miles.

Although each of the 28 estuaries in the National Estuary Program is unique, many face several common environmental problems and challenges. A recent national assessment undertaken by numerous stakeholders from each local NEP (including scientists, citizens, resource managers, policymakers, and business groups) concluded that the most common problems NEPs are dealing with are: 1) nutrient overenrichment; 2) pathogen contamination; 3) toxic chemicals; 4) alteration of freshwater flow; 5) loss of habitat; 6) declines in fish and wildlife; and 7) introduction of invasive species. We have every reason to believe that these problems are common to most coastal watersheds throughout the United States.

The impacts of these problems are serious. Pathogens cause shellfish bed closures. Nutrient-overenrichment contributes to lower dissolved oxygen levels, loss of seagrass and coral habitats, and declines in ecosystem health. Introduction of invasive species adversely affects native species. Changes in land use and the introduction of pollutants and toxic chemicals result in habitat loss and declines in water quality and overall ecosystem health.

The latest data from the National Water Quality Inventory Report to Congress (305 (b) Report) shows that as of 1996, almost 40 percent of the nation's surveyed estuarine waters are too polluted for basic uses, such as fishing and swimming. This

information, obtained by the States, indicates that serious water quality problems persist nationwide.

We are all familiar with the impacts of harmful algal blooms. Pfiesteria outbreaks have occurred in several tributaries to the Chesapeake Bay and North Carolina rivers in recent years, resulting in fish kills, fish lesions, and suspected human impacts. The death and decay of algal blooms can lead to partial oxygen depletion known as hypoxia, or total oxygen depletion, known as anoxia, in the water, resulting in widespread mortality of fish, shellfish, and invertebrates.

There is evidence that associates these algal blooms with nutrient pollution—excess nitrogen and phosphorus—in the water. The sources of these pollutants vary widely from one geographic location to another. However, in general, we see three significant sources: human waste from septic systems and sewage treatment plants; agricultural runoff, including fertilizer and animal waste from agricultural operations; and air deposition of nitrogen and toxic pollutants from motor vehicles and electric utility facilities.

In some cases nutrient overenrichment of coastal waters leads to hypoxia. Hypoxia occurs in many parts of the world, as well as several parts of the United States, including the Chesapeake Bay, Long Island Sound, and the Gulf of Mexico. For example, on the Gulf of Mexico's Texas-Louisiana Shelf, an area of hypoxia forms during the summer months covering 6,000 to 7,000 square miles, an area that has doubled in size since 1993. This condition is believed to be caused by several factors, including: a complex interaction of excessive nutrients transported to the Gulf of Mexico by the Mississippi River; physical changes to the river, such as channelization and loss of natural wetlands and vegetation along the banks; and the interaction of freshwater from the river with saltwater from the Gulf.

Unlike early approaches to environmental protection that target specific pollutants or categories of dischargers, the NEP acknowledges that problems affecting our nation's estuaries are exacerbated by combined and cumulative impacts of many individual activities and that the significance of these activities vary greatly from watershed to watershed. The principal causes of nutrient over-enrichment in the Albemarle-Pamlico NEP, for example, are agricultural, while in Long Island Sound nutrient loadings come from domestic wastewater. In order to address watershed-wide concerns, the NEP encourages the use of a combination of traditional and nontraditional water quality control measures and resource management techniques available through Federal, State and local authorities as well as private sector initiatives. The NEP has strongly influenced our evolution toward watershed management more broadly.

Currently, 28 National Estuary Programs in 18 States and Puerto Rico are demonstrating practical and innovative ways to revitalize and protect their estuaries. For example:

- A Heritage Trail System was established by the Sarasota NEP to enhance recreational opportunities and increase awareness of Sarasota Bay and related cultural, historical, and natural resources. The trail provides a tapestry of recreational areas (greenways), historical places, cultural and art centers, and scenic waterway systems.
- The creation of an island in the San Jose Lagoon, which is habitat to numerous birds in San Juan Bay, was made possible by coordination among the San Juan Bay NEP, the Corps of Engineers, and citizens. The project used debris from a recently constructed bridge.
- The New York/New Jersey Harbor NEP, in coordination with the New York City Parks Department, is using funds from the Exxon Valdez settlement to re-vegetate park areas and reduce sedimentation and erosive runoff in some parks where steep slopes drain into the Hudson River.
- The Narragansett Bay Project worked with the Rhode Island Department of Environmental Management, the city of Warwick, and Save The Bay to reduce bacterial pollution so that Greenwich Bay could be re-opened to recreational and commercial shellfishing.
- The Indian River Lagoon NEP is developing and implementing pollutant-loadings reduction goals based on the requirements of its seagrass ecosystem.
- The Lower Columbia River NEP (OR, WA) is supporting a project to develop a stormwater pollution prevention manual and associated training program focused on voluntary reduction of pollutants from stormwater sources under the direct control of the municipality.
- Using the Santa Monica Bay Restoration Plan as a guidance document, the Los Angeles Regional Water Quality Control Board approved a new, basin-wide municipal stormwater NPDES permit. A large stakeholder committee was formed to develop permit language and numerous public meetings were held, involving many more people than is typically the case with an NPDES permit renewal.

• In Tampa Bay, Florida, 4,000 acres of seagrass and 400 acres of wetlands have been restored.

• The Long Island Sound Study tested two innovative wastewater treatment technologies which resulted in a reduction of nitrogen loadings into the Sound by 83 percent from one treatment plant and 73 percent from another plant.

One of the cornerstones of the NEP is that management decisions are made through an inclusive process involving multiple stakeholders. This emphasis on public participation not only ensures a balanced approach to resource problems, but encourages local communities to take the lead in determining the future of their own estuaries, thus bolstering program success through community support.

At this time, 17 of the 28 NEPs are in the implementation stage. One additional program is scheduled to have an approved plan by the end of 1998; the approval of Comprehensive Conservation Management Plans (CCMPs) for the 10 remaining programs should occur in 1999. (See Attachment 1)

The NEP approach has been very successful. EPA is working actively to ensure that we use what we have learned in these 28 estuaries to protect and improve the health of all coastal ecosystems.

LEGISLATIVE PROPOSALS

With respect to legislative changes, I would like to emphasize the Administration's position supporting comprehensive amendments to the Clean Water Act that would strengthen protection of our nation's waters.

That having been said, I would like to turn now to comment briefly on S. 1321, the National Estuary Conservation Act; S. 1222, the Estuary Habitat Restoration Partnership Act; and H.R. 2207, the Coastal Pollution Reduction Act.

S. 1321—The National Estuary Conservation Act and H.R. 2207, Section 3

We note that both S. 1321 and H.R. 2207, Section 3, would amend Section 320(g) of the Clean Water Act and increase the authorization of the NEP program. Although the language of the two bills differs, I would like to address them together. We would be happy to work with committee staff on particular language.

EPA supports the flexibility that would be provided by giving EPA the authority to allow grantees to use Section 320 funds for implementation of CCMPs as well as for developing them. We believe it is important, however, that State and local governments take primary responsibility for implementing CCMP actions, and that, consistent with the current law, grants authorized by section 320 not be used as the primary source of implementation funds.

EPA should and does have a role in implementation. Section 320 provides that CCMPs, once approved by the Administrator, can be implemented using funds from other existing Clean Water Act programs (notably State Revolving Funds and nonpoint source grants). Many CCMP implementation actions are appropriate for such funding. These programs should continue to be the primary source of implementation funds authorized under the Clean Water Act. Under the Clean Water Action Plan, the Administration has proposed to increase Section 319 grant funds to $200 million.

The process by which the NEPs have achieved success in development of the CCMPs has always emphasized public and stakeholder involvement and commitment to implementation. EPA guidance provides that the implementation action plan specifically state the cost of all actions and the parties committed to fund them. Therefore, we support a cost-sharing type of requirement. We would welcome the opportunity to work with you on the precise language of such a provision that is clear and that protects the principle that CCMP implementation is primarily funded by sources other than Section 320 grant funds.

EPA also supports an increase in authorizations over the original $12 million, given the increased number of NEPs since the program was last authorized (17 programs in FY91 to 28 programs in FY98) and given the Administration's budget request of approximately $17 million for the program in FY99.

S. 1222—The Estuary Habitat Restoration Partnership Act

We believe the goals and purposes of S. 1222 are laudable: a national goal of restoring 1 million acres of estuary habitat by 2010; better coordination of estuary habitat restoration efforts; better leveraging of funds for restoration; linkage of restoration efforts to broader ecosystem planning; and followup monitoring of restoration projects. Many NEPs have identified the need to actively restore degraded habitats, consistent with the CWA's broad goal to "restore and maintain the physical, chemical and biological integrity of our Nation's waters." And, many NEPs have successfully demonstrated habitat restoration techniques. In addition, EPA has gained valuable insights in restoration from the experience we and our partners have had

on the Coastal Wetlands Planning, Protection and Restoration Act (Breaux Bill) Task Force.

However, the operational provisions of the Clean Water Act currently provide few mechanisms through which to pursue restoration—the emphasis is on pollution control. Many waterbodies which fail to meet their water quality standards do so because of physical alterations to the shoreline or streambed, because wetlands have been filled or drained, as a result of once cobbled streambeds silting-in, or because past pollution has killed off submerged bay grasses. Pollution inputs have often been or will be sufficiently controlled so that these areas can once again realize full biological productivity—but only if we give nature a hand by re-vegetating the shoreline, or bay bottom, removing accumulated silt where appropriate, and re-creating habitat for spawning, feeding, and shelter. Many of these bio-engineering practices can also help reduce storm surges and flood damage potential. S. 1222 would complement other provisions of the Clean Water Act and move us in the direction of implementation provisions more attuned to the restoration and physical integrity aspects of the Clean Water Act goal. Chemical and physical improvements are needed to restore the conditions under which aquatic species can thrive.

We would welcome the opportunity to work with the committee staff on specific provisions of this bill.

H.R. 2207—The Coastal Pollution Reduction Act

Much of our progress toward the CWA goals has been realized through the investment of the private sector and local governments in achieving near universal compliance with the baseline of technology-driven pollution control and prevention requirements: "Best Available Technology" for industry and "Secondary Treatment" for municipalities. In the case of the latter these requirements were initially supported through the Construction Grant Program and now are eligible for loans supported by State Revolving Funds. About $74 billion in Federal assistance has helped support a wastewater infrastructure with a significantly higher replacement value. Since 1972, the population served by secondary or better wastewater treatment has increased from 75 million to 170 million. Secondary treatment is not sufficient, however, to achieve the nutrient control needs for such waterbodies as Long Island Sound and the Chesapeake Bay where relatively shallow, poorly mixed waters are sensitive to nutrient inputs from whatever source: wastewater treatment, agricultural run-off, lawn fertilizers, or septic systems. Many municipal treatment facilities discharging to these and other nutrient-impaired waterbodies employ advanced wastewater treatment technology or biological nutrient removal.

It may seem ironic, in light of these circumstances, to be discussing an exception to the requirements met by so many communities many years ago. However, Congress provided for a narrow waiver from the general requirement in section 301(h) for cases where a community discharging to ocean waters could demonstrate among other things that less-than-secondary treatment would not have significant adverse environmental consequences. Few municipalities were eligible for this waiver by its very terms. Fewer still sought the waiver. And even fewer were able to make the necessary showings and were approved.

The waiver provision required municipalities to apply by 12/29/82 and did not provide for reapplication in the event of final denial. The CWA provides that application for and pendancy of a waiver application does not relieve a discharger from the otherwise applicable secondary treatment requirement.

H.R. 2207 would re-open the window for an application for a deep ocean outfall, but would require EPA to apply the same substantive standards for considering a waiver that had applied to previous applicants (including the Puerto Rico Aqueduct and Sewerage Authority (PRASA)) to the owner/operator of the Mayaguez Puerto Rico wastewater facility (PRASA). H.R. 2207 would also require PRASA to make a financial contribution to a watershed initiative intended to stem run-off to the near-shore area.

PRASA first sought a waiver for the Mayaguez wastewater treatment plant to discharge into Mayaguez Bay (not a deep ocean site) in September 1979. EPA tentatively denied the application in 1984 and 1986. A final denial was issued in 1991. The applicant pursued appeals which culminated in the Supreme Court upholding EPA's decision in February 1995.

In a Consent Agreement to resolve PRASA's violations of, among other things, effluent discharge limits, the Federal Government recognized PRASA's intent to seek this legislation but made no committment regarding our position on the legislation. While EPA Region II has had to increase its resources on waiver issues, nationally we have substantantially reduced our resources for evaluating waivers and renewals because the application window closed in 12/82. Further, there are several coral reefs off Mayaguez, and it is important to note that any outfall ultimately approved

by EPA will be consistent with new Executive Order 13089, Coral Reef Protection, announced last month by the President at the National Oceans Conference.

However, we must also note that Mayaguez Bay in general, and the coral reefs in particular, are severely stressed. Conditions may be such that PRASA may be able to provide information to support a decision that, based on construction of a deep ocean outfall, it has met the nine part test established in section 301(h). In light of this, and given that H.R. 2207 is limited to the Mayaguez wastewater treatment plant, includes specific environmental protection requirements, and is consistent with the terms of the Mayaguez Consent Decree, which gives PRASA until August 1, 1998, to obtain legislation allowing it to submit a new Section 301(h) application, EPA neither endorses nor opposes H.R. 2207. EPA is generally opposed, however, to re-opening the opportunity to seek Section 301(h) waivers, given the widespread benefits of secondary treatment and the need to do more to control nutrients in many coastal areas.

CONCLUSION

Thank you for the opportunity to provide testimony on these proposed measures and on EPA efforts to protect our Nation's estuaries and coastal resources. This concludes my remarks and I will be happy to answer any questions you may have.

ATTACHMENT 1

Status of National Estuary Programs

Programs with approved CCMP's:

Program Approval Date:

Puget Sound—May 1991
Buzzards Bay—April 1992
Narragansett Bay—January 1993
San Francisco Bay—December 1993
Albemarle-Pamlico Sounds—November 1994
Long Island Sound—November 1994
Galveston Bay—March 1995
Santa Monica Bay—March 1995
Delaware Inland Bays—June 1995
Sarasota Bay—October 1995
Delaware Estuary—September 1996
Massachusetts Bay—September 1996
Casco Bay—October 1996
Indian River Lagoon—November 1996
Barataria-Terrebonne Estuaries—December 1996
Tampa Bay—March 1997
New York/New Jersey Harbor—March 1997

Programs developing CCMPs:

Program Expected Submittal Date:

Tier 4:

Peconic Estuary—June 1999
Tillamook Bay—February 1999
Corpus Christi Bay—September 1998
San Juan Bay—July 1999

Tier 5:

Morro Bay—June 1999
Barnegat Bay—December 1999
Lower Columbia River—June 1999
Maryland Coastal Bays—June 1999
New Hampshire Estuaries—July 1999
Charlotte Harbor—September 1999
Mobile Bay—September 1999

RESPONSES BY MR. WAYLAND TO ADDITIONAL QUESTIONS FROM SENATOR CHAFEE

Question 1: One of the principal goals of the legislation I introduced, S. 1222, is to create partnerships between all of the federal agencies that oversee estuaries; among federal, state, local governments; and between the public and private sectors. Often, the notion of "partnership" is easier to develop in theory than to execute in practice. Do you have any recommendations for what we could do to ensure that a true partnership is carried out at all levels?

Response. EPA supports the goal of improving partnerships between federal, State, and local agencies, and other organizations. We have been working cooperatively with many federal agencies in supporting estuarine management and protection of coastal and estuarine waters and resources for a number of years. In particular, EPA's National Estuary Program and NOAA's Coastal Zone Management Program and National Estuarine Research Reserve System have significant experience in working together with State and local governments and other organizations to enhance our Nation's estuaries and coasts.

There are a number of lessons from the National Estuary Program (NEP) that can be applied to partnership efforts more broadly. In general, we know that partnerships need time and commitment to develop, as well as continued nurturing to maintain these partnerships over time. It takes time for groups to build strong partnerships and develop the trust to collectively reach decisions, and to ensure buy-in on these decisions. It is also important to ensure that all of the right players are involved in a decision that may affect them, and that they are involved in early stages of an effort. For example, we have seen the importance of involving groups that have not always been a part of coastal discussions, such as oil and gas interests, and the housing and development sector. It would be difficult to legislate these ingredients of success.

As an indication of how important it is to EPA that successful partnerships be established and maintained, I would call the Committee's attention to the Top 10 Lessons Learned document, developed by EPA in partnership with over 100 watershed practitioners and their supporters throughout the Nation. One of the top 10 lessons learned is on partnerships (Partnerships Equals Power). This document describes how focusing on common interests, respecting each participant's view point, thanking each other, being willing to learn about others' needs and positions, and building trust make strong and long lasting partnerships. The other lessons learned are:

- The Best Plans Have Clear Visions, Goals, and Action Items
- Good Leaders are Committed and Empower Others
- Having A Coordinator at the Watershed Level is Desirable
- Environmental, Economic and Social Goals are Compatible
- Plans Only Succeed if Implemented
- Good Tools Are Available
- Measure, Communicate and Account for Progress
- Education and Involvement Drive Action
- Build on Small Successes.

The Top 10 Lessons Learned document is available at our website (www.epa.gov/owow/lessons) or by calling the National Center for Environments. Publications and Information (1–800–490–9198).

Question 2: You mention the common environmental problems of estuaries in the U.S., such as nutrient overenrichment, toxic chemicals and habitat loss. Is there much interaction between the 28 member estuaries of the NEP to develop common solutions to address these problems? Would S. 1222 help elevate the discussion to a national level?

Response. Yes, there is considerable interaction among the 28 NEPs. We believe that S. 1222 could greatly assist efforts to elevate the discussion and interaction on these issues at a higher level, particularly regarding habitat restoration. In fact, the expertise developed by the NEPs could be used by the Collaborative Council in developing the Estuary Habitat Restoration Strategy proposed by S. 1222.

Technical transfer and assistance is a key component of the NEP approach. Collectively, the NEPs have created a significant knowledge base and wealth of experience dealing with the problems that threaten the health of virtually all estuaries, including nutrient overenrichment, toxic chemicals, and habitat loss. EPA believes that an important role of our coastal management program is to facilitate the exchange of information among NEPs and between them and other coastal communities.

In addition, there is considerable interaction among the estuaries in NOAA's National Estuarine Research Reserves and the State coastal zone management programs as well as interaction between EPA and NOAA where we share information on coastal management. S. 1222 would provide additional support for the coordination we are engaged in with those programs, too.

STATEMENT OF MICHAEL L. DAVIS, DEPUTY ASSISTANT SECRETARY OF THE ARMY FOR CIVIL WORKS, DEPARTMENT OF THE ARMY

INTRODUCTION

Mr. Chairman and members of the Committee, I am Michael L. Davis, Deputy Assistant Secretary of the Army for Civil Works. I am here today to present the Department of the Army's views on S. 1222, the Estuary Habitat Restoration Partnership Act.

Army Corps of Engineers Environmental Mission

For over 200 years the Nation has called upon the Army Corps of Engineers to solve many of its water resources problems. Historically, the Corps has emphasized its flood damage reduction and navigation missions. In recent years, however, pursuant to the Water Resources Development Act (WRDA) of 1986 and subsequent WRDAs, the Corps has elevated its environmental restoration and protection mission to a status equal to its flood damage reduction and navigation missions. The Corps now uses its engineering, project management, real estate, and environmental expertise to address environmental restoration and protection opportunities. The Corps environmental mission has been expanding over time with major changes in environmental law and policy, such as the National Environmental Policy Act of 1969, which requires each Federal agency to assess fully its actions affecting the environment, and the Federal Water Pollution Control Act of 1972 (commonly called the Clean Water Act) in which the Corps was given a major responsibility for regulating the discharge of dredged or fill material into all of our Nation's waters, including wetlands. Subsequent WRDAs have expanded further the environmental protection and restoration mission of the Corps of Engineers.

The Corps has a powerful toolkit of standing authorities and programs that can be brought to bear to help solve environmental problems. Over the last decade alone the Corps has helped to restore hundreds of thousands of acres of habitat of many types, and which benefit thousands of fish and wildlife species. Examples include: 28,000 acres of habitat restored for the Upper Mississippi River (98,000 projected by 2005); hundreds of acres of coastal wetlands restored in Louisiana; 35,000 acres of restored flood plain under construction for the Kissimmee River Restoration Project in the Florida; and, hundreds of acres of coastal wetlands restored under authorities which authorize the Corps to beneficially use dredged material for ecosystem restoration.

If enacted, S. 1222 would add to the Corps environmental portfolio. Specifically, S. 1222 would allow the Corps to use its unique skills to restore and protect estuary habitat and help achieve an economically and environmentally sustainable future for the Nation and the world.

Significance of Estuarine and Coastal Areas

Throughout the world, estuarine and coastal areas serve as focal points for human use and development. These same areas also perform critical functions from an ecosystem perspective, providing habitat and food for myriad fish and wildlife species. Estuaries are unique in that they serve as a transition zone between inland freshwater systems and uplands, and ocean marine systems. There is an urgent need to protect and restore these ecosystems recognizing the economic, social, and environmental benefits they provide. As with many environmental issues, future generations depend upon our actions today. In this regard, we applaud the co-sponsors of S. 1222 for their vision and leadership in this area.

S. 1222

The Department of the Army supports efforts to enhance coordination and efficiently finance environmental restoration and protection projects. The goal of restoring 1 million acres of estuary habitat by the year 2010 is in consonance with the President's Clean Water Action Plan and the goal of restoring 100,000 acres of wetlands, annually, beginning in the year 2005. We also agree with the philosophical basis for the legislation, that estuaries and coastal areas are being degraded rapidly, and that there is an urgent need to attain self-sustaining, ecologically based systems that are integrated into surrounding landscapes. The proposed national framework, or national estuary habitat restoration strategy, to be completed at the end of the first year, should help partners identify and integrate existing restoration plans, integrate overlapping plans, and identify processes to develop new plans where they are needed. This framework document could help us maximize incentives for participation, leverage Federal resources, and minimize duplication of efforts. We support the requirement to publish the draft strategy in the Federal Register for review and comment to enhance public involvement. We believe that the legislation is consist-

ent with the National Estuary Program (NEP) which was established to manage and protect aquatic ecosystems in coastal watersheds. The NEP strives to protect and restore habitat through consensus and initiatives which are community-based. The legislation also is consistent with the Coastal Wetlands Preservation Protection and Restoration Act (CWPPRA), or Breaux Bill, a unique multi-Federal and State agency partnership which is working to restore and protect approximately 73,000 acres of coastal wetlands in Louisiana over a 20 year period.

Thus, with a few important changes, the Department of the Army could support S. 1222. First, it is unclear which, if any, agency is to lead the Collaborative Council. This language implies a lead role for the Department of the Army and directs the Secretary to convene meetings. In addition, funds are authorized to be appropriated to the Department of the Army for administration and operation of the Collaborative Council. Funds also are authorized to be appropriated to the Department of the Army to implement estuary restoration and protection projects. While S. 1222 does not explicitly state the intent of Congress, the Department of the Army is prepared to take a leadership role if that is the desire of the Congress.

In order to maintain consistency and avoid confusion, I strongly recommend that the legislation be amended to 65 percent Federal cost sharing in accordance with WRDA 1986, as amended, especially since the bill states that estuary restoration projects could be implemented under section 206 of WRDA 1996 on Aquatic Ecosystem Restoration. As noted in the legislation, successful implementation of estuary habitat restoration projects will depend upon partnerships. At the heart of partnerships are the beneficiary pay reforms, especially cost sharing, which were first included in WRDA 1986, and expanded upon in subsequent WRDAs. These reforms allowed local sponsors the opportunity to be active participants in the water resources development process, thereby revitalizing the Army civil works program. Cost sharing serves as a market test of a project's merits, ensures active participation by project sponsors and beneficiaries, and ensures project cost effectiveness. We have found it to be an eminently successful policy. We are concerned that S. 1222 deviates from the basic cost sharing policies established in the WRDAs for environmental restoration projects, and that the variation in range of possible Federal cost shares, from 25 to 65 percent, could cause confusion amongst the public.

Section (d)(1) of S. 1222 states that the Collaborative Council shall not select an estuary habitat restoration project until each non-Federal interest has entered into a written cooperation agreement in accordance with section 221 of the Flood Control Act of 1970. This requirement was developed with flood damage reduction projects in mind, and provided the Federal Government with some measure of certainty that non-Federal sponsors were fully recognized public bodies empowered to act on the behalf of constituencies, and to assume certain financial and legal obligations. Our experience is that while the need to meet section 221 requirements are still valid for most civil works projects, there are situations where these requirements eliminate very good potential non-Federal sponsors from consideration. For example, certain well-known and established environmental organizations could serve as sponsors for environmental restoration projects envisioned by this legislation. Environmental projects often differ significantly from flood damage reduction projects in that structural measures are kept to a minimum. These projects are formulated to simulate natural functions and values and often result in projects with minimal or no operations and maintenance requirements. Finally, many environmental restoration projects are located in areas where project operations pose no threat to human life or property. For all of these reasons, the Corps has put policies in place to enable consideration of non-governmental organizations for section 1135 projects (Project Modifications for Improvement of the Environment), and our WRDA 1998 proposal contains a provision that would amend section 206 of WRDA 1996, Aquatic Ecosystem Restoration, and a provision that would amend section 204 of WRDA 1992, Beneficial Use of Dredged Materials, to also allow the Corps to consider, where appropriate, non-governmental organizations (NGO) as sponsors for environmental restoration and protection projects. Because of the similarities between these environmental authorities, we recommend revising S. 1222 to allow NGO's to sponsor estuary habitat restoration projects. Further, we recommend that the Collaborative Council make recommendations to the Secretary of the Army on case-by-case bases.

Turning to the factors to be taken into account in establishing criteria for determining project eligibility, we recommend that the legislation require a consideration of the quality and quantity of habitat restored in relation to overall project cost. For environmental restoration projects implemented by the Corps, decision criteria of this kind tend to force a discipline to into the plan formulation and benefit analysis process that facilitates achieving optimal project designs. The criteria help benchmark performance reviews, and stand as a context for describing tradeoff decisions.

A requirement to address both quality and quantity of habitat restored would provide that information required to evaluate performance, at both the project and program levels, and facilitate production of bi-annual reports tied to the national estuary restoration strategy.

Many environmental restoration techniques and approaches are new, and when dealing with natural systems, there is a need to test new ideas, learn from successful projects and not so successful projects, and manage adaptively to adjust to ever-changing conditions. Adding a demonstration component with a cost share that is consistent with the rest of the program, and a requirement for non-Federal sponsors to manage adaptively, would encourage the partners to try out new ideas, and learn more about how to restore and protect estuary and coastal areas. Environmental restoration efforts for the Florida Everglades, the Upper Mississippi River System Environmental Management Program, and the Breaux Bill, all acknowledge, to varying degrees, the value of demonstration projects and adaptive management approaches.

The Army Civil Works program plays a critical role in providing and maintaining water resources infrastructure to meet future needs in consonance with other national priorities and a balanced budget. We try to avoid creating false hope by not authorizing projects that we cannot reasonably expect to fund or complete within a reasonable timeframes. In light of the $20 billion backlog of ongoing Corps construction projects, and other authorized projects awaiting construction, the dollar magnitude for new projects and programs in the Administration's proposal for WRDA 1998 was constrained. Thus, while we could support being involved in a program to restore and protect estuaries and coastal areas, we are concerned that this new program could negatively impact other new and ongoing projects and programs which have been carefully prioritized and evaluated for phased implementation over a period of years. We are committed to a sustainable long-term construction program and more timely project delivery to non-Federal sponsors. The Administration's proposal for a new harbor services fee is one means to help address these funding constraints.

CONCLUSION

The Corps has been increasingly involved in recent years with efforts to protect and restore the benefits of estuaries and their surrounding habitat. We are especially proud of our efforts in conjunction with the Coastal America initiatives. Some examples of actions where the Corps, using its available programs, was in the lead for multi-agency, multi-level efforts (Federal, state, local and private) include restoration of a coastal salt marsh area in the Galilee Bird Sanctuary, Rhode Island; the initial demonstration area for restoration of tidal wetlands in the Sonoma Baylands, California; and, the Sagamore Salt Marsh Restoration, Massachusetts. Our fiscal year 1999 budget request includes study funds for 10 potential projects directed at protecting or restoring the benefits of estuaries, as well as funding for many other activities that would be beneficial to the environment in or adjacent to our Nation's estuaries.

My staff and I have enjoyed working with you and your staff on S. 1222 and other legislation before your committee, including a 1998 WRDA. We look forward to continuing this relationship as work on this important legislation continues. The Department of the Army is looking forward to working with the Departments of Commerce, Agriculture, Interior, and Transportation, and the U.S. Environmental Protection Agency to restore and protect our nation's aquatic resources as outlined in the President's Clean Water Action Plan. Mr. Chairman, this concludes my testimony. I would be pleased to answer any questions you or the committee may have.

RESPONSE BY MICHAEL DAVIS TO ADDITIONAL QUESTION FROM SENATOR CHAFEE

Question. One of the principal goals of the legislation I introduced, S. 1222, is to create partnerships between all of the federal agencies that oversee estuaries; among federal, state and local governments; and between the public and private sectors. Often, the notion of "partnership" is easier to develop in theory than to execute in practice. Do you have any recommendations for what we could do to ensure that a true partnership is carried out at all levels?

Answer. The Army would approach implementation of S. 1222 in accordance with policies and procedures which grew out of the Water Resources Development Act (WRDA) of 1986, subsequent WRDAs, and long-standing partnership and public involvement practices. We would recommend looking to models of successful partnerships established for the Florida Everglades, coastal Louisiana, San Francisco (CALFED Bay Delta), the Upper Mississippi River, to name a few, and adapting as-

pects of those models when implementing of S. 1222. You can be assured that Army Civil Works is committed to making partnerships work, and that the cost sharing principles established in WRDAs enhance greatly the effectiveness of partnerships for water resources projects.

STATEMENT OF H. CURTIS SPALDING, EXECUTIVE DIRECTOR OF SAVE THE BAY, INC. PROVIDENCE, RI

On behalf of Save The Bay's 20,000 members, I would like to thank Senator Chafee and the Committee for this opportunity to present testimony in support of S. 1222, the Estuary Habitat Restoration Partnership Act. Save The Bay is a member-supported nonprofit organization. Our mission is to restore and protect Narragansett Bay and its watershed.

Five years ago, over 20 nonprofit organizations met to discuss the future challenges for our nation's estuaries and to set a course of action to meet those challenges. Many of our coastal areas were beginning to reap the benefits of the Clean Water Act. In Narragansett Bay, harbor seals and oysters were starting to return after decades of absence due to polluted water. Despite similar limited recoveries in many of our nation's estuaries, we shared a deep concern that many species of fish, birds and other animals were not recovering as we had expected. Also troubling, some coastal areas not previously affected by water pollution were now in serious decline.

After months of inquiry and discussion, we saw that the problem with the health of our estuaries was no longer grossly polluted water, but the ongoing loss of habitat for fish, birds, shellfish and plants along our shorelines and in our watersheds. Thus in late 1994, Restore America's Estuaries was formed. It is a current partnership of 11 nonprofit organizations from Seattle to Galveston to the Gulf of Maine. Over the past 4 years, each organization has identified and targeted the habitat resources in its own estuary and coastal environment that are threatened and in need of restoration. Restore America's Estuaries has pledged collectively to restore one million acres of habitat to our nation's estuaries by the year 2010.

How the Estuary Habitat Restoration Partnership Act Will Restore America's Estuaries

An important word in the title of this legislation is "partnership." It is a lesson we have learned well in Narragansett Bay communities. Over the past 3 years we have provided technical assistance to many neighborhood associations, conservation commissions, golf course managers and land trusts to help them restore their local salt marshes or eelgrass beds, which are Narragansett Bay's most threatened habitat resources. People care so much that they are volunteering their time and energy to restore these areas. Save The Bay trained these volunteers to research the Bay's salt marshes. Local community groups have adopted local salt marshes and eelgrass beds. We connected them with the other groups and agencies that could help them accomplish their restoration goals. We have helped these groups get things done by educating them about coastal restoration and helping them apply for and win funding from existing government grant programs. The measure of our success, although in its beginning stages, is our willingness to be a true partner with these local activists. These are not "Save The Bay" habitat restoration projects, they belong to the community.

The one barrier to greater success is the lack of a coordinated and unified program at the Federal level to help facilitate and fund community based restoration projects. And there are limited resources on all levels of government. In Portsmouth, Rhode Island, a neighborhood association struggled for 5 years through a maze of regulation, amassing funds from several government and private programs and overcoming government inertia to help restore five acres of salt marsh. A similar restoration effort in Narragansett took 8 years. Unfortunately, the current agency structures do not encourage habitat restoration and in fact are an active deterrent. The only encouraging point on local restoration projects in Rhode Island is that these efforts have been rewarded. Rarely seen wildlife and healthy coastal and estuarine habitats are returning to Rhode Island's coastline. But the struggle to design, fund and coordinate these projects is too long and too costly for most volunteer organizations and community groups to sustain.

The Estuary Habitat Restoration Partnership Act can change this situation by making effective use of limited resources. The bill will help coordinate many overlapping plans and programs and bring down the barriers to habitat restoration. The bill places a strong emphasis on moving on-the-ground restoration projects forward

quickly, as opposed to funding more plans and studies that tend to be collect dust in government libraries.

The Situation in Narragansett Bay

Why do we need this bill to become law as soon as possible? Because the foundation of life in Narragansett Bay is in critical condition. The Bay's natural systems its eelgrass beds, salt marshes and fish runs which allow it to function healthfully, are severely damaged or disappearing. For example, we have only about 100 acres of eelgrass left in the Bay, which once supported thousands of acres. Eelgrass prevents shoreline erosion, filters pollution, and provides clear water, food, shelter, nurseries and breeding grounds to shellfish, juvenile lobsters, and young fish. About half of our salt marshes have been lost. What we have left is degraded and getting worse. Salt marshes are nurseries for many species, help prevent erosion and filter toxins from our water. Flounder, striped bass, mussels, scallops, fiddler crabs and scores of birds rely on salt marshes for some or all of their lives. We have only 15 functioning fish runs left in Rhode Island. To survive, many fish must be able to get to fresh water to spawn. One of our Bay's greatest fisheries the Atlantic salmon now can only be read about in books, due to the destruction of their fish runs. We must turn the tide soon, and begin to repair decades of damage and neglect or it may be too late.

Narragansett Bay is not just a place where the fresh water of the rivers meets the salt water of the ocean. It is a place that shelters and nurtures a complex web of life. From the smallest creatures living in its mud to the seals that migrate here for the winter, the Bay is home to hundreds of species. Plants and animals including humans depend on each other and form what we call the "web of life" in Narragansett Bay.

We can compare Narragansett Bay to the human body. The decline in our eelgrass, salt marshes and fish runs are warning signs, not so different from changes in a person's vital signs. We would not ignore a loved one's complaint of chest pains, shortness of breath or numbness in their arms and legs because these are signs of a potentially deadly heart attack or damaging stroke. Likewise, we cannot ignore the Bay's symptoms. If eelgrass, salt marshes and fish runs continue to decline and disappear, the Bay will be little more than an empty body of water. The Bay life that depends on these areas the lobster, shellfish, birds, fish and plants will disappear. Necessarily, many people who make their livelihoods off the Bay will have to find other work. This is not the kind of Bay we want or should leave for our children.

Crashing Fish Stocks

The most evident sign that the Bay's web of life is unraveling is the near collapse of many Narragansett Bay fisheries in the past twenty years. Many fish populations are in decline despite improvements made to control toxins and water pollution. Despite stricter management of commercial fishing, fish populations have not recovered.

Although much of the decline in Bay fisheries can be attributed to over-fishing, the loss of eelgrass beds and salt marshes is preventing any significant recovery of fish stocks. Eelgrass beds critical to thriving Bay fisheries have dwindled to only 100 acres remaining in Narragansett Bay. A 1988 report by the Rhode Island Department of Environmental Management (RIDEM) estimated that between 1965 and 1982, Rhode Island lost over 850 acres of coastal salt marshes about 20 percent of the marsh we had in 1965. We are now feeling the pain of ongoing habitat loss.

Save The Bay has focused our attention on three critical habitats in Narragansett Bay which are most in jeopardy underwater eelgrass, salt marshes and fish runs. Restoring these critical habitats is essential if we are to sustain the myriad of Bay creatures that depend on them.

Eelgrass Beds A Flagship for Life in Our Bay

Eelgrass is:

- an underwater marine plant;
- a primary source of food for hundreds of Bay plants and animals;
- a critical nursery and shelter for shellfish and finfish;
- a supplier of clear water; and,
- a guard against shoreline erosion by dampening waves and currents.

(Batiuk et al 1992, Thayer et al 1975, Short and Short 1984).

Eelgrass, one of 50 kinds of seagrass, is a marine plant that lives completely underwater. Eelgrass is one of the most diverse and productive underwater habitats found in the United States and Europe. Eelgrass can form large meadows or small separate beds, which range in size from many acres to just a yard across (Burkholder and Doheny, 1968). The largest remaining meadow in Narragansett

Bay borders the eastern shore of Jamestown and covers about 25 acres. Found in depths from 3 feet to 20 feet, eelgrass growth and survival is dependent on clear water and strong sunlight.

Eighty species of worms, mollusks, crustaceans, echinoderms, fishes, reptiles, and birds depend on eelgrass as a food source (McRoy and Helfferich 1980; Thayer et al. 1984). This list of dependent species includes economically important finfish and shellfish species such as summer and winter flounder, weakfish, blue crabs, rainbow smelt, bay scallops, blue mussels and spotted seatrout. Research has demonstrated that eelgrass provides higher survival rates for juvenile American lobster than rock or mud habitat types (Barshaw and Bryant-Rich 1988).

Eelgrass loss can have devastating consequences. Eelgrass decline led to the extinction of the eelgrass limpet (a type of snail) in the 1930's, one of the few marine species extinction known in this century. Our disappearing eelgrass has been a primary cause of the collapse of brant geese populations in the Bay. Brant geese depend on eelgrass as a primary food source.

Eelgrass loss also has dire economic consequences. The loss of eelgrass in Narragansett Bay led to the collapse of the bay scallop fishery in Rhode Island. The bay scallop fishery has been nonexistent in Rhode Island since 1957, primarily due to the loss of eelgrass beds. The bay scallop needs eelgrass as a settling area and as a refuge for mature scallops (Pohle et al. 1991). There is a neighborhood in Warwick along Greenwich Bay that used to be known as "Scalloptown" because so many scallop fishermen lived and worked there. Greenwich Bay and other northern locations in Narragansett Bay once supported hundreds of acres of eelgrass and healthy bay scallop populations. Eelgrass restoration in Narragansett Bay could contribute to the revival of the once thriving commercial bay scallop fishery. Eelgrass restoration can also help rebuild other commercially important fisheries. More than 20 types of commercially valuable fish feed in the eelgrass beds of Narragansett Bay at some point in their lives including winter and summer flounder, lobsters and tautog.

Restoration is possible. Efforts to re-establish eelgrass have taken place over the last three decades. The National Marine Fisheries Service believes Narragansett Bay has a high potential for eelgrass restoration, based on its historical distribution and a concentration of scientific and academic resources in the region (Fonseca, et al, NMFS, 1994). Active restoration through transplanting began in Narragansett Bay in 1994. Both the National Marine Fisheries Service and the University of Rhode Island have identified and transplanted eelgrass in sixteen separate sites in the Bay. While these efforts have had limited success due to a variety of factors including predators grazing the transplanted stock, storm damage and the relative low density of transplanted eelgrass, research and experiments with improved methods of restoration should continue.

Although poor water clarity poses the greatest problem for eelgrass restoration, we can take steps to correct this problem. The eelgrass beds which remain in the Bay offer hope that areas of the Bay may be able to host transplants. But, taking no action is not acceptable. The clear water that is necessary for restoration is also critical to saving the eelgrass remnants still clinging to Narragansett Bay. Ultimately, we must improve the conditions for eelgrass immediately if we are to save this vital thread in the Bay's web of life.

Salt Marshes A Place of Bountiful Plants & Creatures

A salt marsh is:

- a nursery and spawning ground for two-thirds of the United States' major commercial fish;
- the largest producer of basic food per acre anywhere on earth;
- a nursery for 63 species of fish in Narragansett Bay; and,
- a shoreline stabilizer and shield against coastal storms.

(Lieth, 1975; Teal & Teal, 1969; McHugh, 1966; Dept. of Interior, 1989; Knudson et al, 1982)

Salt marshes provide enormous economic and environmental benefits. Approximately two-thirds of the United States' major commercial fish depend on estuaries and salt marshes for nursery or spawning grounds (McHugh 1966). Among the more familiar salt marsh-dependent fishes are menhaden, bluefish, flounder, sea trout, mullet, croaker, striped bass and drum. At least 63 fish species use Narragansett Bay as a nursery, with the highest use in the fall (Department of the Interior, 1989). Salt marshes are also important for shellfish including bay scallops, soft-shell clams, grass shrimp, blue crabs, oysters, quahogs and other clams. Blue crabs and grass shrimp are especially abundant in the tidal creeks that feed salt marshes. Salt marshes produce more basic food energy per acre than any other known ecosystem including tropical rainforests, freshwater wetlands or agriculture fields (Lieth, 1975 and Teal & Teal, 1969).

Salt marshes protect private property by shielding coastal shorelines from storms and by dampening the power of waves, which stabilizes the shoreline (Knudson, et al. 1982). While most wetland plants require calm or sheltered waters, established salt marsh grasses are effective against erosion (Kaldec & Wentz, 1974; Garbisch, 1977).

Restoration of salt marshes may help protect our health as well. Rhode Island is home to 42 different mosquito species. The salt marsh mosquito, along with three other species, is known to carry the Eastern Equine Encephalitis virus and transmit it to humans, horses and other mammals. Large populations of these mosquitoes can present an increased health threat to humans. To breed and develop, mosquitoes need standing water. In the 1930's ditches were dug through many of Rhode Island's salt marshes in a vain attempt to eliminate standing water on the marshes. Not only did the ditches fill in with debris creating larger mosquito breeding areas, but also restricted nature's best mosquito control larvae eating minnows and other fish from reaching the mosquito breeding grounds. Ditching, in most cases, created a larger problem than previously existed. Old mosquito ditches are affecting most of the Bay's salt marshes. Restoration is necessary to remove the ditches and help nature control mosquito populations and the Eastern Equine Encephalitis virus.

Despite all of these important benefits, we recruited over 80 volunteers to survey the health of Rhode Island's remaining salt marshes. Their findings are alarming and demonstrate the existing threats to Rhode Island's salt marshes. Seventy percent of the Bay's remaining salt marshes are affected by restrictions to the daily ebb and flow of tides, reducing their ability to support Bay fisheries. Over 60 percent of the salt marshes show signs of dumping or filling. Mosquito ditches drain over 50 percent of the marshes. About 1,200 of the 3,800 remaining acres of Bay salt marshes are impacted by invasive plant species such as the tall common reed, phragmites. Phragmites can grow to over 10 feet tall, block shoreline vistas and pose a fire hazard when they die in the winter and early spring leaving dry plant material close to coastal homes. Nearly thirty percent of our remaining salt marshes have no protection from polluted runoff from lawns, golf courses and parking lots. About 58 percent of Narragansett Bay marshes suffer from the polluted discharges of storm drains.

Restoration is feasible and the only way to bring back the marshes. Successful salt marsh restoration efforts have occurred in many New England states including Rhode Island, Massachusetts and Connecticut. In Massachusetts, salt marshes north of Boston have been restored through an innovative mosquito control program called "Open Marsh Water Management." This technique involves re-creating the natural water conditions in the marsh thus allowing mosquito-eating minnows to survive in tidal pools and creeks. Connecticut has reopened many Long Island Sound marshes to the normal ebb and flow of tides halting the growth of invasive phragmites in the process. Locally, Rhode Island began restoring the marshes at the Galilee Bird Sanctuary by scraping off old dredge spoils, opening culverts, and re-creating tidal creeks. A community-sponsored marsh restoration was recently completed at Common Fence Point in Portsmouth. The project involved removing dredge spoils and re-grading a five-acre area of phragmites to allow salt marsh grasses to re-colonize the area. Since the completion of the project in the fall of 1997, plants and animals are beginning to return to the area. Many community groups throughout Rhode Island want to restore salt marshes, but lack the necessary funding and technical support.

Fish Runs A Legacy of Vanishing Abundance

A fish run is:

- a freshwater river or stream that runs directly to the Bay;
- the place where native herring, salmon, smelts and shad return each spring to spawn; and,
- the spawning grounds for herring stocks that are an important food source for striped bass, bluefish, herons, otter and osprey.

(RIDEM, 1996; Desbonnet & Lee, 1991)

River herring, Atlantic salmon, rainbow smelt, sturgeon and American shad depend on fish runs for survival. These are saltwater fish that are hatched in freshwater, but mature and spend most of their lives in the Bay or the ocean. These fish must return to the freshwater rivers and streams where they were born in order to spawn. Narragansett Bay previously supported commercially valuable Atlantic salmon and alewife (river herring) fisheries. River herring are a primary food source for striped bass whose continued recovery is dependent on increasing sources of food. The Atlantic salmon fishery was short lived in Narragansett Bay after the industrial revolution began harnessing the power of the Blackstone, Ten Mile and Pawtuxet Rivers. The salmon were effectively blocked from returning to the waters

of their birth. The Blackstone and Pawtuxet each ended up with one power producing dam for every mile of river by the middle of the 19th century. The Atlantic salmon was eliminated from its Bay spawning runs by 1869 (Goode, 1887).

The commercial herring fishery depended on Rhode Island fish runs. As with the Atlantic salmon, the herring fishery declined, but managed to linger much longer. Herring do not need the same type of river conditions as salmon. They attempted to adapt to other rivers and streams that were not dammed in the southern areas of the Bay. Commercial harvesting was forced to a halt in Narragansett Bay by 1930 because of declining fish stocks. A few areas still support small runs of river herring including Gilbert Stuart Brook in North Kingstown and the Annaquatucket River in North Kingstown. The largest and healthiest herring and shad run in Narragansett Bay is on the Nemasket River in Massachusetts a tributary of the Taunton River where over one million fish came to spawn in 1996 (pers. comm, P. Brady).

But many fish runs remain obstructed. In Rhode Island and Massachusetts combined, there are 27 rivers that could be spawning grounds for herring, shad and Atlantic salmon. Only two of these river systems were never harnessed for water power or water supply and host small native runs of herring. Ten more rivers have fishways any structure that allows fish to swim over dams, including fish ladders to help herring and shad pass over dams and swim to spawning areas. But 15 are still closed to spring fish runs of herring, shad and salmon. Among these 15 rivers are three of the top five freshwater tributaries of Narragansett Bay the Blackstone, Pawtuxet and Ten Mile rivers.

There are a number of steps we can take to restore our fish runs. We can remove unnecessary dams and build fish ladders over dams that must remain. We also can restore streams and improve water quality to make these rivers and streams once again hospitable to fish runs.

What this Crisis Means to Rhode Islanders

On September 22, 1997 Senator Chafee came to a small boat yard in Narragansett Bay to announce the introduction of the Estuary Habitat Restoration Partnership Act (S. 1222). This legislation is a vital component in our efforts to bring back healthy conditions not only in Narragansett Bay but in Chesapeake Bay, Long Island Sound, Puget Sound and many of the other vital estuaries of the United States. At that press conference Senator Chafee said, "Narragansett Bay is good for the soul." No truer words had ever been spoken about the meaning of Narragansett Bay to all Rhode Islanders.

Narragansett Bay is our home. Even if we live miles from its shores, it is part of what makes Rhode Island special. The Bay is our lifeline it nourishes our environment, strengthens our economy, enhances our leisure time and protects our children's futures. We need to care for the Bay and invest today in its health and very survival. This investment will help ensure a secure future for Rhode Island.

Narragansett Bay is an engine for Rhode Island's economy. It is estimated that Narragansett Bay generates $2.4 billion in annual revenue from marine and Bay related activities (estimates, Rorholm and Farrell, 1994). Commercial fishing and the tourism industry are major contributors to our state economy. Restoration is a small investment to keep this economic engine running.

Commercial fishing is estimated to generate $42 million dollars for the Rhode Island economy each year. For many communities, the harvesting of quahog, fish and shellfish is central to a healthy local economy. The fishing industry understands the importance of balancing the needs of industry with ecological concerns. Fishermen realize the need to restore Narragansett Bay to give the fish and shellfish they harvest an ability to replenish and thrive. Without restoration, the fishing industry's future in Rhode Island is uncertain.

No one understands this more than Paul Bettencourt and Don Dawson of Pawtcuket, RI. Like two gruff midwives, these graying fishermen assist in the final leg of an otherwise impossible spawning journey by dipping a long-handled scoop net beneath the foam and magically lifting a half dozen squirming, blueback herring above the roaring mouth of the Ten Mile River. They help the herring upstream into Omega Pond beyond the salt waters of the Bay a task these fish have been unable to accomplish themselves for many generations. They do this because they have witnessed the consequences of disappearing fish runs firsthand. As a young man, Paul Bettencourt made a living harvesting herring for bait for other fishers angling for striped bass, lobsters and blue fish. Paul now refers to himself as a living "dinosaur."

But restoration means much more than helping fishermen. In 1993, for the first time in Rhode Island's history, the travel and tourism industry surpassed manufacturing to become the state's second largest industry. In 1997, tourism brought in over $2 billion to the state. Narragansett Bay is key to that industry. People come

to Rhode Island from all over the world to enjoy the beauty and splendor of Narragansett Bay. Whether sailing Bay waters or fishing for striped bass this resource is an enormous treasure for residents and visitors alike. An increasingly unhealthy Bay will lose its appeal.

Narragansett Bay is part of our lives. Tony Giardino knows this. Born just south of Naples, Italy, Tony came to Rhode Island in 1927. Fishing trips with his dad at Narragansett Pier sparked a lifelong passion for the sport and the Bay. Tony's Barbershop, a fixture on Providence's Hope Street for the last fifty years, is a great place for a haircut and stories about the big ones that did not get away including his 58-° pound striper. When Tony learned to fish, flounder was almost always the fish of choice they were plentiful and did not put up much of a fight, once hooked. But the Rhode Island tradition of teaching kids to fish by catching flounder is fading fast and, without adequate restoration measures, may soon be gone forever. Tony taught his kids to fish by first catching flounder but says now it is "pretty much a waste of time" to take his grandchildren in search of flounder. "They're just not out there anymore," says Tony. "I am worried that the flounder are disappearing and I think it is a shame that I cannot teach my thirteen grandkids to fish for flounder."

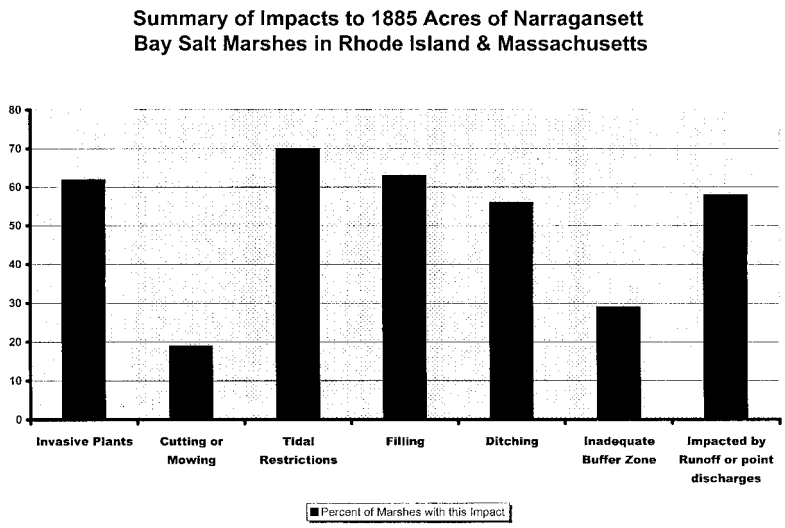
Narragansett Bay is as important to our future as it has been to our past. We can leave our children a Bay that gives them the pleasure of discovering the wonders of a summer beach by collecting seashells and tasting fresh baked clams and scallops. We can pass on the opportunity to swim in the Bay's waters or hear the rustle of reeds in the salt marsh. We can afford them the thrill of landing their first mighty bluefish. We can guarantee them the joy of seeing a heron fishing in a salt marsh or saluting the rising moon. We can allow them to see a quahogger working a rake. All of these opportunities are part of our Rhode Island and national heritage, part of our past and present. These opportunities can be a part of our future if we make a commitment to restore Narragansett Bay and all of the other nation's estuaries great and small.

Make no mistake. Narragansett Bay and most of our nation's estuaries are in crisis. Rhode Island and many other regions have only a limited time to take action and resolve this crisis. If we do not restore America's estuaries soon, many fish, plant, and bird species may become extinct in this country. With this disappearance, the United States will lose many jobs that depend on these species and our quality of life will plummet.

In conclusion, Save The Bay applauds the leadership of Senator Chafee on this critical issue. The need is so great and the situation so precarious that to delay at this point would certainly mean greater losses for our coastal environment, our economy and our quality of life. Twenty-six colleagues of Senator Chafee, from both sides of the aisle, also understand this grave situation and have signed on as cosponsors. If we truly want to restore our nation's fisheries, preserve our coastal heritage and improve our economy we must give our Federal Government agencies the opportunity to actually help with this task. Not just with more funding but with tools to break down the barriers of bureaucracy and to build partnerships with local community efforts.


Eelgrass Beds 1996
Save The Bay partnered with the Narragansett Bay Estuary Program to conduct aerial mapping of Eelgrass Beds July 1996. Initial analyses estimate only 100 acres of eelgrass remain in the Bay
Providence
Bay Eelgrass Size Classes
Map Layers
RI & MA
unknown size
<= 0.9 acres
>0.9 to 20 acres
>20 acres
0
15,000
Feet
Funding for this project was provided By: R.I. Aqua Fund, U.S. EPA/RIDEM Narragansett Bay Estuary Program, Save The Bay and Project Data Generation/Analysis: U. Mass. Natural Resources Assessment Group, Digital Mapping Data: RIDEM GIS Program, Municipal Sponsor: City of Warwick, RI

Approximate Historical Distribution of Eelgrass in Narragansett Bay 1840-1979



RESPONSES BY CURTIS SPALDING TO ADDITIONAL QUESTIONS FROM SENATOR CHAFEE

Question 1. Much of what our efforts in the past have focused on, with respect to water quality for estuaries and other waters, is pollution prevention, not habitat restoration. How do you see the two actions, protecting the resource from further degradation, and nursing the resource back to health, interacting to reach the larger goal of improving overall water quality?

Response. Save The Bay and indeed all RAE member organizations believe that protection and active habitat restoration are two sides of the same coin of environmental health for our estuaries. While it is true that much effort and resources have been devoted to pollution prevention and better waste treatment technology, the science of habitat restoration is just beginning to explore and test new techniques. One of the most compelling arguments for linking restoration and protection efforts is the remarkable connections that habitats provide in estuaries and other waters. For example, underwater seagrasses, once established, create the ideal physical, biological and chemical conditions for more seagrass to grow. They also provide invaluable benefits to the overall water quality such as filtration of sediments and nutrients as well as dampening waves. Coastal and riparian wetlands provide not only habitat for fish and other wildlife but also "pollution prevention" services to the rivers and coastal waters they border. They trap sediment, filter runoff and control coastal and riverbank erosion. In this way, coastal habitats offer their own unique "pollution prevention" services that enhance our considerable investment in engineering-based pollution prevention.

Question 2. What is the biggest challenge that Save The Bay has faced in getting habitat restoration projects of the ground? Is it working with government agencies, lack of funding or something else?

Response. Our biggest challenge in Rhode Island is getting technical assistance to local restoration efforts. We literally have dozens of groups ready and willing to initiate local restoration projects but without the biology, engineering and design expertise most of these projects will have to wait perhaps years to get going. The state has yet to make either a financial or policy commitment to coastal and estuarine habitat restoration. There is no "Office of Habitat Restoration Assistance" where these groups can go for help. We have helped a few groups cobble together a package of technical assistance, design work and funding. Funding can also be an issue. It not so much that there isn't enough, it's a matter of finding it and knowing how and where to apply.

STATEMENT OF JOANN BURKHOLDER, PROFESSOR AND PEW FELLOW, NORTH CAROLINA STATE UNIVERSITY

A Former Marine Fisheries Commissioner's Perspective

Salt marshes, underwater grasslike meadows filled with shellfish. mangrove forests, and quiet, open waters with rich fisheries are what come to mind for people when they consider estuaries, the natural areas where rivers meet the sea. But the reality of this view has rapidly changed in the past several decades. Different scenes now inundate us with the "signs of the times" . . . of elderly folk's remembrances of times when a rowboat filled with fish could be taken within an hour, in areas where fish are now rare; of commercial fishermen who acknowledge overfishing pressures involved with fish declines, but who seem to have no voice when they question why their fish nursery grounds have received another sewage outfall, of why yet another coastal river that was classified as an "outstanding resource" has been destroyed by the newest subdivision. As Chair of the Habitat & Water Quality Committee on North Carolina's Marine Fisheries Commission, I had no answer for them because in that state, and many others, fisheries are managed "separately" from water quality issues, and the respective commissions that governed these issues had not once met in the decades since they had been formed.[1]

The overall economic value of our estuaries is significantly underestimated because estuaries provide many "intangible" services, as well as tangible goods such as seafood. . . . One acre of tidal estuary has been calculated to equate the operation of a. $115,000 waste treatment plant (1984 figure, consumer price index 103.9; adjusted for 1997, CPI 160.6; increase of 54.6 percent—Dr. J. Foley, natural resource economist, Norm Carolina State University) in pollutant filtering/removal capabilities.[2] The total land value, alone, of estuarine habitat has been estimated at about $128,000 per acre when fish production is factored into consideration. By comparison, 1 acre of prime farmland in Kansas was valued at $1,800 with an annual production value of $900.[2] Estuaries are also among the most productive ecosystems in the world. U.S. estuaries and coastal wetlands provide spawning grounds for 70 percent of our seafood including shrimp, salmon, oysters, clams and haddock, with associated jobs for millions of people. [2]

In their position along the land-water margin of our coastal zones, estuaries are known to be highly vulnerable to human pressures. Estuaries receive most of the excessive loadings of pollutants that reach marine environments.[3] As a result, these waters and the fish and waterfowl that directly depend on then have been seriously impacted by sediment erosion from adjacent land development; microbial pathogens from septic leachfields, urban runoff and land disturbance; excessive nutrients from untreated or poorly treated sewage; oil spills from common boating practices as well as major incidents; pesticides from cropland and lawn runoff, and other stressors.[4] These impacts are exacerbated by often-dramatic changes in hydrology within the watersheds that estuaries ultimately service. Extensive (among and channelization of freshwater rivers completely altered the natural salt balance Us many estuaries, as well as the volume of water supplied.[5] Ditching and filling in of salt marshes and other wetlands in estuarine ecosystems move pollutants into receiving rivers quickly and directly.[1] Pollutant loadings are on the increase in many coastal areas of our country,[2] coinciding with exponential human population growth and associated loss of the wetlands which acted as a filter to protect the rivers that drain them.[6] Over half of the worldly population already live within a 100-mile radius of a coastline, a pattern that includes our country. [6] More than half of our coastal habitats have been destroyed or damaged by dredge/filling and by waste contamination, including many of the sea-grass beds that are vital habitat for commercially important finfish and shellfish.[2] [7] A steadily increasing proportion of our coastal wetlands and adjacent creeks that provide vitally important habitat for our shell fisheries have disappeared as coastlands are developed. Many of those that remain look healthy . . . but then, one rices the posted signs that prohibit fishing for Oysters or clams because the shellfish have filtered out too many pollutants from adjacent lands, and would no longer be safe for human consumption. Overall across the nation' only about half of our shellfish waters are now "clean" enough to produce edible seafood.

These are the overt, easily noticed "signs of the times." But other, more subtle human influencing on estuaries will likely prove much more serious in the near future, unless we support measures such as S. 1222, in order to better equip ourselves to combat them. Scientists understand acute or obvious, severe impacts of pollutants on fish and other wildlife supported by estuaries. By contrast, little is known about the chronic or sublethal impacts of many of our actions on fisheries and other important estuarine, resources. Repeated research on all coasts of our country has shown that fish from waters near major human population centers have suppressed

immune systems, higher incidence of bleeding sores, gonadal tumors and other diseases, and other serious health impairment relative to fish in cleaner waters. . . . Physiological stress in fish that lead to decreased growth, reproduction, survival of young, and long-term survival of adults has been demonstrated from small amounts of pollutant such 49 pesticides, petroleum compounds, and trace metals, over longer time internals.

Such toxic substances (as caustic chemicals) would be expected to cause adverse impacts. However, even the effects of more pollutants that are regarded as relatively "benign," such as nutrient over-enrichment—especially of nitrogen and phosphorus, the same kinds of nutrients that would be used to fertilize house plants—are proving to be much more serious than had previously been suspected. The foundation of the food web in aquatic ecosystems is algae. These plants are open microscopic, and they have enormous surface area relative to their small size. Bathed in their water environment, algae have easy access to dissolved nutrients. They can be stimulated by extremely small levels of nutrient supplies, micro-quantities in comparison to how we typically think about in adding nutrients, which is by the pound (for lawn fertilizer) or the ton (for our crops) Thus, aquatic ecosystems are highly sensitive to nutrient loading, and too many nutrients often translates into noxious blooms of algae as estuaries are shifted out of their natural balance. Although algae are generally good for estuaries, nutrient over-enrichment from sewage, cropland runoff, lawn runoff, animal wastes, and other sources can stimulate too much algal growth. At night the respiration of these small plants—millions of which can be contained in a few drops of water—can rob the oxygen from the water and cause fish kills. Such conditions increasingly characterize many of our estuaries. This description is especially true of many quiet lagoons or upper embayments with poor water exchange/renewal, where nutrients have time to stimulate substantial algal growth before they are flushed from the system. Too many algae can block light from reaching beneficial underwater seagrass meadow habitat for our fisheries. Without enough light, the seagrass meadows disappear, ant such habitat loss has been strongly correlated with devastating declines in commercial fisheries.[7]

The proliferation of algal overgrowth that shade out and destroy seagrass beds is an obvious impact of nutrient over-enrichment. However, the following two examples illustrate other more subtle but serious impacts of chronic nutrient enrichment on aquatic ecosystems. In the first case, recent research has demonstrated a more subtle impact of nitrate loading on the most important seagrass habitat species on the north temperate coasts of the U.S., namely eelgrass or Zostera marina. Very small amounts of nitrate loading to the overlying water, given daily for several weeks can cause these plants to die as a direct toxic effect, unrelated to algal overgrowth.[7] Zostera is highly sensitive to nitrate loading (e.g. from septic effluent leachate) because, surprisingly, it has no way to stop nitrate uptake through its leaves, For thousands of years, historically this plant was accustomed to nitrogen-depauperate coastal waters. The ability to take up nitrate, day or night, through the plant leaves—nitrate from storm runoff or other sudden, unexpected source—may once have represented a great advantage in nitrogen-limited waters over other plants that generally cannot Me up nitrate in darkness. However, with increased coastal nitrate loading from human activities, our most important north temperate seagrass now appears to be seriously disadvantaged because of this "strategy" to take up nitrate at all costs, whenever it is available in the water. The excessive nitrate uptake is rather analogous "too much candy"—it is not good for these plants. It forces Zostera to direct most of its energy and other nutrient supplies, such as carbon, into amino acid production, even when it does not need the amino acids. Thus, too much nitrate—at concentrations that would be regarded as very low, relative to current conditions in many estuaries that drain increasingly urbanized watersheds—drives Zostera into severe internal imbalances in other nutrients, which can lead to death. This phenomenon was first reported in 1992. The full extent of damage to eelgrass meadow habitat from chronic exposure to elevated water-column nitrate has only begun to be examined.[7]

A second compelling example of subtle but serious impacts of nutrient (both phosphorus and nitrogen) over-enrichment to estuaries clearly has direct implications for human health. In 1991, I led a research team that discovered the toxic dinoflagellate, Pfiesteria pisicida, as a causative agent of massive estuarine fish kills.[9] At sublethal, chronic levels the toxins a from Pfiesteria can also cause major incidence of fish disease, in which millions of fish can be affected with large open, bleeding sores. The affected fish often die, but more slowly and much less noticeably than would be detected in an obvious, acute kill in which fish accumulated at the water surface. Moreover, chronic exposure to small amounts of Pfiesteria's toxins over days to weeks may cause much more serious problems at the fish population level than an acute fish kill that affects a small number of fish relative to the total

population size.[10] The known range of chronic end sublethal impacts from these toxins on fish, thus far, includes several immune system suppression, unpaired reproduction, significantly depressed survival of the young, destruction of the osmoregulatory system (i.e., fish cannot control their salt balance, which is very serious in the changing salinity environment characteristics of estuaries), and large-scale disease. Such impacts suggest that Pfiesteria's toxins seriously damage the ability of fish to reproduce, and of young as well as adult fish to survive or fight disease.

These impacts of Pfiesteria on fish health—even the obvious impacts that can be visually observed through major fish kills—have only been known for less than a decade, because of this organism's rapid "attack/retreat" behavior which made it difficult to detect and track.[9] Two other important points of information were gained within the past 5 years, which clearly illustrate that Pfiesteria can be stimulated by human activities, and that chronic or sublethal exposure to Pfiesteria's toxins merit concerted attention and action—because these toxins can impair the health of people, as well go fish. First, we determined that Pfiesteria can be strongly stimulated by nutrient over-enrichment from multiple apthropogenic sources such as human sewage, animal wastes, cropland and town fertilizer runoff[10] [11] Second, we learned that people who are exposed to toxic cultures of Pfiesteria, or to toxic outbreaks where fish me diseased or dying from Pfiesteria can be seriously hurt just by inhaling the overlying air.[12] [13]

Production of airborne neurotoxins had not previously been known for toxic dinoflagellates. Before this unusual feature of Pfiesteria was determined, people who worked with dilute toxic cultures Of fish-killing Pfiesteria without protection from airborne toxins sustained a suite of effects.[12] Short-term impacts (hours) included narcosis, nausea, vomiting, burning eyes and skin, blurred vision, severe stomach cramping and acute respiratory difficulty. Longer-term impacts (weeks to months) included severe headaches, open sores that heal slowly (months) and do not respond to antibiotics, and impairment of all three nervous systems—central, peripheral, and autonomic. Lingering impacts (years) have included easy infections suggestive of a compromised immune system, certain visual impairment, episodes of foggy memory, and peripheral autonomic nervous system dysfunction. The central nervous system impacts to laboratory workers from Pfiesteria's toxins were most striking, and involved severe cognitive impairment and short-term memory loss. Imagine what it is like to appear normal, but to have no idea, of where you are, to be unable to put words into sentences, or to understand English. You have lucid moments in which you are gripped with fear because you realize that something is terribly wrong; then you slide back down. As you begin to recover, you must take reading lessons to be able to read again. Imagine life style changes—that even after you are able to test normally for learning and memory, you must compensate because you have lost the ability to process information as quickly as you could before the illness occurred, and you do not recover it. Imagine not being able to strenuously exercise because when you try, you develop severe bronchitis or pneumonia. Consider what it would be like to be a fairly young, energetic person who must be on antibiotics more than a third of the year, 5 years after being affected . . . what it would be like to watch as increasingly potent antibiotics do not help you recover from the most recent, nearly constant illness, and to fear the prospect of reaching the point at which the most potent antibiotics no longer can help. The above writing describes the lives of several laboratory workers, ongoing five to 7 years following exposure to dilute, field densities of toxic Pfiesteria culture.

The first clinical evaluations of people exposed to small toxic outbreaks of Pfiesteria in estuaries were completed in late summer 1997.[13] The resulting impact that were documented on learning and memory function were described by health officials as "profound." About 85 percent of the fishermen who had been in these toxic outbreak areas for 6–8 hours per day, for several weeks or more, tested in the lower 8 percent of the U.S. population for learning ability and memory, once corrected for age and education and about 75 percent of the examined fishermen tested in the lower 2 percent of the U.S. population in cognitive functioning ability. The documented impacts were striking even for people with minor exposure—25 percent of the people who were examined after they took a boat ride through a toxic outbreak, or stood on a bridge over an affected area, tested in the lower 8 percent of the U.S. population in their ability to learn and remember. Most of the affected people had recovered and were able to test. at least, in normal range for cognitive ability and memory function within 3 months following exposure. However, 20 percent of the fishermen who had been exposed longest to the toxic outbreaks were unable to test normally until 6 months after their last exposure. Although they recovered to normal testing range, much of the 6-month interval remains "lost"—they have no

memory of it, and that period likely will remain lost as it has for the exposed laboratory workers.

Such impacts from Pfiesteria, stemming from nutrient over-enrichment to quiet estuarine waters, were completely unanticipated. Many scientists, having carefully evaluated all of the known information data on Pfiesteria, are now considering a sobering hypothesis, that Pfiesteria represents the first of such "hidden" or previously unknown microbial pathogens to have been discovered as we inadvertently continue, through excessive pollutant loadings, to shift estuaries from their natural balance. As scientists, we may have done the "easy part," that is, we previously recognized aquatic microbes that cause obvious problems for fish or human health, but a new group may be emerging that counts Pfiesteria among its first known representatives. What is clear, at present, is that this example of subtle but serious impacts from water quality degradation in our estuaries unites the issues of estuarine water pollution, fish health, and human health. For the sake of our own health as well as the health of our fisheries, we must move beyond the obvious to gain much sponger appreciation for The subtle but serious impacts of our actions in degrading water quality and otherwise altering estuarine habitats.

Exponential human population growth in many coastlands of our county is projected to continue for at least the next two decades.[2] Thus, balancing the enormous economic grown along our coastlands with conservation practices—that is, wise use of our coastal resources—is a challenge that is both immediate and pressing. We have not been winning this battle, and we can do much better. S. 1222 represents a major, exciting step toward meeting this challenge.

Estuary Restoration: Maximizing Progress

As a scientist who has acted in policy evaluation, in positions shalt were appointed by both republican and democratic Governors, I have long considered the question of how to maximize progress in improving the quality of our estuaries. I regard the partnership, cost-sharing approach outlined in S. 1222 as highly constructive in bringing all stakeholders together, from industries and municipalities to individual citizens, in working to achieve this overall goal. Within that context, the suggestions offered here include four major areas of emphasis, and stem from my earlier efforts in contributing to a policy document with similar focus.[1]

Certain efforts are critically needed to maximize progress in restoration of our nation's estuaries. First, we should accelerate river and watershed cleanup through a strong incentive program. This cleanup effort needs to incorporate alternate/improved methods of waste disposal that reduce point source pollutant loadings (e.g., encouragement of adequate methods of land application, plant upgradings to employ biological nutrient removal techniques). Non-point pollution historically has proven much more difficult to control, and a major effort must be undertaken to design incentives programs that work for farmers, municipalities attempting to control urban runoff, and animal production industries, for example. Small-scale contributors, who collectively can become significant, should also be a focus of these programs, such as homeowners or golf course managers who use fertilizers and pesticides in lawn care. Acceleration of river and watershed cleanup, additionally, must involve restructuring hydrologic flow patterns to restore natural flow patterns in watersheds that drain into estuaries. A critical problem facing many coastal areas, and already impinging on estuarine ecosystems, is depletion of coastal aquifers and other water supplies.[5] Strong water reuse programs are needed as an essential component of estuarine system restoration. Coastal reserves should be expanded to further conserve key environmental habitats such as estuarine fish nurseries.[1]

Secondly, success in the above actions will require additional information/programs including resource inventories where needed at state and local levels, so that baselines can be established where needed and progress can be tracked. Such demonstration of progress will provide, of itself, a strong incentive to foster sometime difficult efforts to achieve continued positive action. Accurate maps of submersed aquatic vegetation, wetlands, shellfish beds, nurseries, spawning grounds, and other habitats vital to our fisheries should be delineated and updated at appropriate intervals.[1] Programs to strengthen protection at these critical habitats should be strengthened. Attainment of con of the above goals also will require additions answers and information that must be provided by research. Examples of research needs include:

- development/testing of water reuse techniques to maximize effectiveness in specific locations/regions;
- design of techniques and models to improve accuracy ire quantifying the contributions of various pollutant sources;
- development of improved indicators or biosensors of water quality and habitat degradation;

- assessment of the contribution of groundwater to estuarine habitat/water quality degradation;
- design of improved techniques to create value-added products from various waste sources;
- development of improved methods for constructing habitats with adequate functioned value to replace lost natural habitats; also development of improved techniques for restoring functional value to degraded wetlands, seagrass beds, and other vital estuarine habitats for our fisheries; and
- characterization of the full extent of chronic and sublethal impacts from major pollutant loadings on both aquatic communities (especially early life history stages) and the health of people who live and work near the affected estuarine waters.

Lastly, but arguably of greatest importance in information acquisition is the need to support research in natural resource economics, so that the full value of both short-term and the long-term goods (products) services (filtering pollutants, flood control, habitat provision, aesthetics in attracting, tourism, etc.) that are contributed by estuaries can be accurately appraised and imparted to our citizens.

A third major ingredient to maximize progress in restoration of our nation's estuaries will be to promote development of comprehensive environmental education and outreach programs that begin in pre-school, extend to high school and college, and continue to touch all citizens throughout their lives.[9] Such programs are needed in every state from the heartland to the coasts—for example, a major body of research now indicates that the ca. 700 square-mile zone of low-oxygen that extends out from the Mississippi delta along the Gulf Coast of Louisiana has resulted, in large measure, from pollution carried, from north-central states down the Mississippi River. The receiving estuary is impacted by states far removed from coastal Louisiana, and restoration will not be possible without understanding, cooperation, and assistance from the heartland states 'upstream.' Federal, state and local programs that encourage responsible development should be developed/strengthened, with the goal of restoring and maintaining the high-quality waters and habitat, needed to sustain our fishery resources.

The fourth major area of emphasis that will be required to minimize success in estuary restoration will be to work to both significantly improve enforcement of existing laws aimed at conservation (wise use) of estuarine resources, and to strengthen legislation where needed.[1] Many laws designed to protect or improve water quality in our rivers and receiving estuaries would go far toward achieving widescale estuarine restoration, if they were meaningfully enforced. It is imperative that the set of tasks that must be undertaken to accomplish this goal include development of a strong incentive program to encourage all participants to both want to follow existing laws and to have the means afforded for that to be possible. Innovative, creative programs will be required, and must be developed, to increase the funding support that will he needed to achieve this extremely important goal. They are within reach;[1] this country is great, in large measure, because of people through our history who have contributed creative, constructive thinking in solving major problems. As previously mentioned, many impacts on estuaries from human activities originate upstream. States should enact/strengthen a freshwater wetlands protection statute, similar to those that are available in many coastal states for saltwater wetlands. This freshwater wetlands statute should provide incentives to private landowners to conserve these important habitats for water quality control. Such improvements will need to be accompanied by changes in the current "turfdom" of estuarine resource management in order to achieve a more integrated approach among, for example, fishery and water quality managers.[1]

Efforts are also needed to strengthen the success of the Coastal Area Management Act (CAMA). Partnerships at state levels should work to create programs to provide the fiscal resources and technical assistance to local governments in preparing and implementing high-quality land use plans.[1] Moreover, the design of land use plans should be altered so that these plans are required to consider the cumulative and secondary impacts of growth not only on development of the land itself, but also on water quality and water supply. For example, at present, land use plans developed under CAMA are not require to assess the carrying capacity of adjacent waters to assimilate the additional wastes that would be associated with expanded community growth and development. The greatest progress in restoring our estuaries will be accomplished when that connection can be realized in the increasingly urbanized coasts setting.

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STATEMENT OF J. WALTER MILON, PROFESSOR, FOOD AND RESOURCE ECONOMICS DEPARTMENT, UNIVERSITY OF FLORIDA

Chairman Chafee and Members of the Senate Environment and Public Works Committee: I thank you for the opportunity to present a brief summary of research on the economic value of the Indian River Lagoon, an estuary of national significance and part of the Environmental Protection Agency's National Estuary Program. The information presented here is derived from a study I coordinated as part of a team organized by Apogee Research Inc., a nationally recognized leader in environmental and natural resource economics. This study was sponsored by the Indian River Lagoon National Estuary Program (IRLNEP) and the St. Johns River Water Management District, the state sponsor for the IRLNEP. The study is presented as one documented example of the value of estuaries nationwide.

The Indian River Lagoon, one of the nation's most biologically diverse estuaries, stretches 156 miles along Florida's east coast spanning Volusia, Brevard, Indian River, St. Lucie and Martin counties. These five counties are home to more than 1 million residents and host more than 6 million visitors each year. The number of residents in the five counties of the Lagoon is expected to increase from 1.25 million to 1.54 million between 1995 and 2005—a 24 percent increase in 10 years.

In developing estimates of the economic value of an environmental resource such as an estuary it is important to consider the scope and extent of human activity related to that resource. The accompanying Table 2–4 (from Section 2 of the report Economic Assessment and Analysis of the Indian River Lagoon which is included as Addendum A) shows the scope of activities considered in the Indian River Lagoon study. These activities range from traditional economic uses such as the value of commercial and recreational harvests from the Lagoon to more intangible economic values such as the enhancement of land values adjacent to the resource and individuals' values for preserving the resource. The full report presents the valuation methodologies and data collection used in the study so I will not describe those here.

The results summarized in Table 2–4 show the importance of the Lagoon to the economy of the region in 1995. Recreational fishing by residents and tourists was estimated to contribute approximately $340 million per year; swimming, boating, water sports, and nature observation activities around the Lagoon contributed another $287 million annually. Commercial harvesting of shellfish such as clams, oysters, and crabs contributed nearly $13 million annually. In addition, residential land values were enhanced by the presence of the Lagoon in the amount of approximately $825 million (see Table 2–1 in Section 2) which can be expressed as an annualized value of $33 million. Collectively, the direct values associated with the Lagoon on an annual basis amounted to more than $725 million.

These Lagoon-dependent activities create additional indirect impacts on the regional economy. Businesses related to recreation, tourism, and fisheries generate nearly $4 billion or about 17 percent of total output within the region (see pp. 10—12 of Addendum B). Resident and tourist spending for Lagoon related activities accounted for more than 19,000 jobs in the region.

These measures of the economic contribution of the Indian River Lagoon can be compared to the costs of implementing the Comprehensive Conservation and Management Plan (CCMP) developed as part of the IRLNEP. The CCMP includes recommendations to maintain and restore the Lagoon through water quality management and habitat protection. These costs were estimated to be less than $18 million annually (see pp. 12—14 of Addendum B) indicating that the costs of sustaining the activities dependent on the Lagoon are modest relative to their economic contribution within the region. Properly designed funding plans could spread these costs equitably so that the average citizen in the region would pay no more than $10 per year. In addition, public surveys conducted for this study showed that residents would be willing to pay more than three times the estimated annual cost to implement the CCMP (see Addendum A, pp. 2–12—2–13).

The results of this study, while limited to a single estuary, help to illustrate the economic importance of estuaries in regional economies and the linkage between environmental quality and economic development. The economy of the Indian River Lagoon region depends upon the ecosystem services provided by the estuary and future development within the region will be linked to adequate maintenance of the health of this ecosystem. Studies such as the one I am reporting to you are an integral link in helping citizens and public officials understand the relationship between the health of estuaries and local economies (see Addendum C for a supporting statement from the St. Johns River Water Management District).

I hope this information will be useful to the Committee. I will gladly provide you with any details about this study or any other information about economic valuation of environmental and natural resources that would assist the committee in its deliberations.

ADDENDUM A TO THE WRITTEN STATEMENT OF J. WALTER MILON

"ESTIMATED ECONOMIC VALUE OF THE INDIAN RIVER LAGOON IN 1995"

SECTION 2 OF ECONOMIC ASSESSMENT AND ANALYSIS OF THE INDIAN RIVER LAGOON—NATURAL RESOURCE VALUATION OF THE LAGOON.

report submitted to the finance and implementation task force, indian river lagoon national estuary program by apogee research, inc. in association with resource economics consultants, inc. january 1996.

INTRODUCTION

The Indian River Lagoon as an Economic Asset

The Indian River Lagoon is many things to many different people: it offers unique vistas of tropical habitats and barrier islands; it supports a diverse array of flora

and fauna; it attracts people to live, visit, and enjoy the region's natural amenities; it supports industries and jobs from renewable resources; and, in its entirety, it is one ofthe most unique ecosystems in the United States.

Some may assert that it is highly presumptuous to assume that economic value can measure the worth of this ecosystem to society.

There are several reasons why a measure of economic value for the Indian River Lagoon is useful and indeed critical to the success of proposed resource management programs. First, in a society that frequently gauges the importance of objects and places by their monetary value, information about the economic value of a natural resource may enhance public understanding of the contributions that resource makes to the community. Second, information about the economic value of the Lagoon can help to establish priorities for the use of public funds to maintain its value. Finally, and perhaps most importantly, economic value information is necessary to evaluate the economic merits of action plans developed by the Management Conference for the Comprehensive Conservation and Management Plan (CCMP).

Economic value information presented in this volume is based on both primary (newly collected for the specific purposes of this study) and secondary data (collected previously for other studies). Where applicable secondary data were available from previous economic or biologic studies or surveys of Indian River Lagoon, those data were utilized. However, in at least three areas existing data were insufficient or inadequate and required the collection of primary data:

- A critical lack of data for all types of recreational activities (fishing, swimming. boating, nature study) within the Lagoon. Most ofthe available data did not identify if these activities occurred within the Lagoon or in the adjoining Atlantic Ocean.
- No activity- and site-specific estimates of the nonmarket values associated with recreational activities within the Lagoon.
- No estimates of passive use values ofthe Lagoon.

In order to provide the necessary primary data, two separate surveys were conducted. A telephone survey collected information from residents of Volusia, Brevard, Indian River, St. Lucie and Martin Counties, while an intercept survey collected information from nonresident visitors. Visitors were surveyed at Sebastian Inlet State Park, Ron Jon Surf Shop in Cocoa Beach. Melbourne International Airport, Mangrove Mattie's at Ft. Pierce Inlet, and the Kennedy Space Center. The data collected in the surveys were used to develop:

1. Participation rates and economic values for recreational activities in the Lagoon by both area residents and nonresident visitors;
2. Estimates of willingness to pay for Lagoon restoration and management programs; and
3. Estimates of passive use values.

The survey results, questionnaires and methodology are summarized in this section and described in detail in Section 3 and Appendices 3-A through 3-E.

Other elements of the economic valuation of the Indian River Lagoon summarized in this section address three areas:

1. The effects of riverfront location on residential property value, discussed in Section 4,
2. The value to recreational anglers of access to the Lagoon and of increased catch rates for their targeted species, discussed in Section 5, and
3. The value of commercial shellfishing for Lagoon-dependent species, discussed in Section 6.

The following subsection introduces concepts important to understanding economic valuation.

Types of Economic Value

The broadest, and perhaps most straightforward, distinction to make in economic valuation is between market and nonmarket values. Market values are the most common type of dollar values measured because market values result from the normal day-to-day transactions for private goods such as food, clothing, and household goods. Market values are relatively easy to identify as long as information is available about the total volume of the transactions.

On the other hand, nonmarket values are values that people have for goods they enjoy but for which there are no explicit transactions to be monitored and therefore no readily available dollar values from such transactions. For example, when a recreational angler decides to fish in the Lagoon, he or she derives value from the fishing experience yet does not have to make an explicit payment for the right to fish (other than a license, if required). The fact that the angler does not pay for the right to fish is a result of the "public good" nature of the Lagoon. That is, the Lagoon is not owned by any entity, rather it is a resource held in common by the public. By way of comparison, if the angler had instead decided to go bowling, he would

have had to pay for the recreational activity according to the time of participation (e.g., number of frames or games). The amount the angler would be willing to pay to fish is the proper measure of the nonmarket value of recreational fishing in the Lagoon. But, since no transaction actually occurs, some method must be used to identify this nonmarket value.

Recreational fishing also provides a good example of an activity that has both market and nonmarket value components. Since the angler may incur certain expenses to go fishing in the Lagoon (e.g., bait, fuel expenses, and equipment), he has revealed a willingness to pay the market price for goods and services that accompany the fishing experience. This is a measure of the market value of recreational fishing. Combining this market value with a measure of the nonmarket value yields the total economic value of recreational fishing, generally

Total Economic Value = Market Value + Nonmarket Value

Many activities that utilize the resources of the Lagoon such as recreational boating, swimming, and nature study have both market and nonmarket values. Therefore, a complete valuation of the Lagoon must consider the total economic value whenever appropriate. Some activities, however, may be fully valued in the market and have no nonmarket value component. Other activities, such as passive viewing of the Lagoon or a concern that the resources of the Lagoon continue to exist for future generations (referred to as existence value), have no market value component and would be measured solely by nonmarket value.

A second important distinction in the types of economic values is between direct and indirect values. Direct values are the result of an explicit. causal linkage to an activity. For example, the sales of fish landings of the commercial fishing industry is an expression of the value of the waters and especially the quality of the water of the Indian River Lagoon since the industry harvests the commercially valuable (market) products of the marine ecosystem. Similarly, recreational anglers' activities have a direct value that is explicitly linked to the Lagoon. On the other hand, indirect values are less explicit and difficult to link with resources. For example, a boat manufacturer located near the Lagoon may have higher sales due to recreational boating activities on the waters of the Lagoon. But the Lagoon has only an indirect value to the manufacturer because boats can be sold in other markets or used in other water bodies and the manufacturer's output is not tied as directly to the Lagoon as is the commercial fisherman's output.

This report addresses only the direct economic values of human Lagoon-related activities. as indirect values are beyond the scope of the study. The analysis includes both market and nonmarket uses of the Lagoon, and estimates in Section 3 a passive use value from willingness to pay data collected in the surveys of residents and nonresident visitors.

Economic values for recreation activities and passive use developed from the surveys are based on the contingent valuation method (CVM). This widely applied method uses survey questions to elicit people's values for goods and services that are not provided through traditional market processes. The questions are typically designed to measure an individual's willingness to pay for a good or service, whether enjoyed actively or passively. The question format may be developed to create a hypothetical market or a hypothetical referendum. The hypothetical referendum is designed to elicit from the respondent an estimate ofthe increase in his or her value resulting from a choice, such as supporting increased stormwater management for Lagoon environmental quality improvement.[1] This referendum format was used in both the resident and nonresident surveys.

The hypothetical referendum applied to estimate a willingness to pay for Lagoon CCMP programs by its nature generates somewhat subjective dollar values. Because the individual is responding to an interview rather than an actual purchasing or decision-making situation, his or her statement of willingness to pay is made without an actual consideration of affordability or ability to pay. The respondent does not have to open a wallet or check book before stating a willingness to pay. He probably does not consider what purchases he may have to delay or forego in order to state his willingness to pay. Willingness to pay estimates of dollar value are therefore approximations.

The following four subsections of Section 2 describe the analytical approach and the results of the economic valuation:

- Lagoon riverfront location effects on residential property value;
- Market and nonmarket value of resident and nonresident recreational activities;

[1] Questions asked respondents directly what he/she would be willing to pay in the form of an increase in local taxes for certain programs to improve Lagoon environmental quality.

- Resident and nonresident willingness to pay for Lagoon environmental quality; and
- Market value of commercial fishing.

A fifth subsection assembles and summarizes economic values.

Lagoon Riverfront Residents Land Value

The influence of the presence and environmental quality of a waterbody, particularly in coastal areas, on the value of adjacent or nearby land is significant. The value that people have for the Lagoon is partially capitalized[2] in the prices of land in proximity to the Lagoon with the result that land parcels located near or on the riverfront can be expected to command higher prices than parcels further from the riverfront. Both market and nonmarket values, such as the aesthetic value of the Lagoon view, may be capitalized in land value. The difference between the aggregate value of land near or on the Lagoon riverfront and the aggregate value of parcels more remote from the riverfront is an approximate measure of the capitalized value that people have for the Lagoon.

To approximate the capitalized value, the study obtained appraised residential-use land value data developed by county property appraisers. The staff of Volusia, Brevard, Indian River, Indian River, St. Lucie and Martin counties provided parcel counts and appraised land values for riverfront and nonriverfront residential use property. County data files permitted only riverfront land to be distinguished from nonriverfront land; the value effects of location near, as opposed to on, the riverfront could not be estimated. The analysis performed with the data addresses the impact on land value only and not improvements to land.[3]

As shown in Table 2–1, in the five-county region the difference in residential land appraised value attributable to Lagoon riverfront location is approximately $700 million. Considering that the county appraised land values are approximately 85 percent of estimated market value, consistent with Florida Department of Revenue Guidelines,[4] the difference in residential land market value attributable to Lagoon riverfront location would be about $825 million ($700 million divided by 0.85). This figure is an underestimate ofthe actual influence ofthe Lagoon on land values since it includes residential riverfront only and not all land in proximity to the Lagoon.

On a county-by-county basis, as Shown in Table 2–1, the difference in appraised land value attributable to the Lagoon ranges from $304 million in Brevard County, which includes about half of the length of the Lagoon system, to $69 million in St. Lucie County. In the case of Volusia County, about half of the north-south dimension of the county is within the Lagoon region and half is within the Halifax River Region; therefore half, or $100 million, of the total Volusia County difference in appraised land value attributable to estuaries and their tributaries is included in the aggregate $700 million.

In order to compare the capitalized land values with other annual dollar flows estimated in this study, the land values must be converted to annual dollar flows. These approximate capitalized values may be converted to annual flows by the simple exercise of multiplying the capital value by a discount rate that represents the time value of money. That is, the discount rate selected should exclude risk and inflation expectations normally contained in market interest rates. A risk-free interest rate is represented by 30-year U.S. government bonds. As of August 31, 1995, the 30-year bond rate was 6.6 percent.[5] This rate is adjusted to exclude inflation expectations by deducting the 1994 rate of inflation, or 2.6 percent.[6] Therefore the analysis used a discount rate of 4.0 percent (6.6 less 2.6) to convert capitalized land values to an annual flow. The annualized total market value of riverfront location is approximately $33 million ($825 million multiplied by 0.04).

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[2] Capitalized value may be defined as the present value of a stream of benefits obtained from the land over the anticipated ownership period.

[3] An analysis of the effect of riverfront location was not made for improvements to land because of the uncertainty in the data introduced by the wide variation in improvements. Nevertheless, the value of improvements made to riverfront residential properties is informative. Appraised value of improvements to riverfront property range from $431 million in Brevard County to $89 million in St. Lucie County. The total appraised value of improvements aggregated across the five counties is approximately $1.17 billion. Since these appraised values are approximately 85 percent of market value, the aggregate market value of improvements is about $1.4 billion. In contrast to values for land alone discussed above, the value of improvements is only partially attributable to riverfront location.

[4] Florida Administrative Code 12D-8002 (4).

[5] Wall Street Journal, 31 August 1995.

[6] Carol McLarty, oral communication, 8 September 1995. Bureau of Economic and Business Research, University of Florida.

Another approach to examining the difference in value attributable to Lagoon riverfront location is to develop certain ratios for comparison. A "value indicator" may be constructed by relating percentage of value and percentage of parcel count for both riverfront and nonriverfront land. as detailed in Section 4 of this report. The ratio of the value indicator for riverfront land to that for nonriverfront land relates the relative value of the two locations. Table 2–2 summarizes the results of this exercise for the five counties. Volusia County demonstrates the highest ratio of riverfront to nonriverfront value at 8.1 while Brevard County demonstrates the lowest ratio at 4.6. In other words, this comparison suggests that riverfront land in Brevard County is 4.6 times as valuable as nonriverfront, while in Volusia County riverfront land is 8.1 times as valuable as nonriverfront.

While land values are not as sensitive to incremental improvements in environmental quality of the Lagoon as recreational and commercial fishing values, it is clear that a significant value is associated with the Lagoon presence. Deteriorating environmental conditions in the Lagoon over the long term could negatively affect the value of riverfront property.

Table 2–1. Incremental Value of Residential Land Attributable to the Indian River Lagoon

County	Riverfront Average Parcel Value	Nonriverfront Average Parcel	Average Parcel Difference in Value	Incremental Value of Land Attributable to Riverfront Location	Market Value[1]
Volusia[2]	$132,919	$15,937	$116,981	$100,077,000	$117,738,000
Brevard	106,351	23,174	83,177	303,930,000	357,565,000
Indian River	237,197	31,429	205,768	90,949,000	106,999,000
St. Lucie	71,928	12,578	59,350	69,025,000	81,206,000
Martin	212,136	40,389	171,128	137,066,000	161,254,000
Total	$125,362	$20,548	$104,814	$701,047,000[3]	$821,762,000

[1]Appraised value divided by 85 percent, as discussed in text.
[2]Volusia County entries are adjusted to recognize that roughly half of the north-south dimension of the county is within the Lagoon basin (Mosquito River) and half is within the Halifax River basin. Since county parcel counts and values could not be separated for the two basins, the total numbers of each are simply divided in half. Thus the value of Indian River Lagoon riverfront residential land in Volusia County is estimated at $100.1 million, while the total value of all estuarial riverfront land (Mosquito River plus Halifax River) is $200.2 million.
[3]The total value calculated vertically will not equal the total calculated horizontally because of statistical anomalies in the data. The statistically non-normal distribution of the nonriverfront parcel values reduces the average nonriverfront parcel value, which in turn inflates the average riverfront parcel value and the average difference. Thus when the average riverfront parcel value is multiplied by the total riverfront parcel count, the product is overestimated.

Table 2–2. Comparison of Riverfront and Nonriverfront Value Indicators

County	Riverfront Value Indicators	Nonriverfront Value Indicators	Value of Riverfront to Nonriverfront
Volusia	7.91	0.98	8.1
Brevard	4.21	0.92	4.6
Indian River	7.15	0.95	7.5
St. Lucie	5.46	0.95	5.7
Martin	4.9	0.93	5.3

Value of Recreational Activities

The two surveys conducted in this study sought to identify the types of recreational activities, rates of participation in those activities, and value of market expenditures made for those activities by both residents and nonresident visitors to the five counties ofthe Indian River Lagoon.

As detailed in Section 3 and associated appendices, a stratified, random digit dialing telephone survey of 1,000 adult (at least 18 years of age) residents was conducted in February and March of 1995. Two hundred interviews were conducted in each county, resulting in sampling error rates of + 3 percent for the region and + 8 percent for each county (with a 95 percent level of confidence in both cases).

The nonresident visitor survey was completed during April and May 1995, using personal interviews with adults who are not Florida residents. A total of 500 interviews were completed. producing a sampling error rate of + 4.5 percent. Interviews were conducted at five popular visitor destinations in the region. Sebastian Inlet, Ron Jon Surf Shop, Melbourne Airport. Mangrove Matties and Kennedy Space Center. Due to limited information on visitor populations in individual counties, the survey results cannot be evaluated for individual counties.

Recreational Participation

Survey results indicate that participation in water-based recreation in the Indian River Lagoon is significant for both residents and visitors. Resident respondents indicated a 24 percent participation rate in recreational fishing and 17 percent in boating, as shown in Figure 2–1. Visitors indicated a heavier preference for swimming and nature observation, with participation rates at 55 percent[7] and 48 percent, respectively, as shown in Figure 2–2. Overall, the results indicate that a large share of nonresident visitors associate their recreational activities with the Lagoon.

Recreational Value

Total annual recreational expenditures by residents are estimated by multiplying the per person participation rate for each recreational activity times each county estimated 1993 population (from the 1994 Florida Statistical Abstract, Table 1.35). The multiplication product is then multiplied by the average respondent-estimated annual expenditures for that recreational activity. Total annual recreational expenditures by visitors are similarly estimated by multiplying the per party estimates given by those surveyed times the total number of visitor parties. Resident recreational activities total $256.5 million across the five counties, with recreational fishing at $149.1 million representing over half of the total as shown in Figure 2–3. The largest single activity value for visitors is swimming at $112.2 million, which reflects the high participation rate reported, but may also reflect some confusion between swimming in the Lagoon and swimming in the Atlantic Ocean. Total 1995 visitor recreational expenditures are $230.9 million, including recreational fishing expenditures estimated at $43.3 million. Visitor expenditures are summarized in Figure 2–4.

Combined estimated 1995 recreational expenditures of both residents and visitors surveyed total $487.4 million. The combined estimated expenditure for recreational fishing and shellfishing alone totals $198.5 million, demonstrating the significance of recreational fishing in the economic value of the Lagoon. These expenditures for fishing as well as the other activities represent the estimated market value of the recreational activities, as discussed earlier. Table 2–3 summarizes both resident and visitor respondent-estimated expenditures for recreational activities in the region (Section 3 and related appendices provide more detail).

While a nonmarket value also exists for all of these activities in the form of the value of access to the activities which exceeds the cost of the activities (in economic parlance, consumer surplus). collecting and analyzing the necessary data is beyond the scope of this study. However, because data were already available for recreational fishing, the value of access to the Lagoon for resident recreational fishing is estimated in this report. The data[8] utilized were collected for the Indian River Lagoon region in 1992. Section 5 describes in detail the development and application of statistical techniques known as random utility travel cost models with which the value of access is estimated.

Using travel cost model techniques, the annual value of access to the Lagoon for recreational fishing by residents is estimated to range from $589 per angler in Martin County to $110 per angler in Se. Lucie County. Extending the per angler values across 1995 county populations and participation rates yields a total nonmarket access value of $140 million per year for recreational fishing in the Indian River Lagoon.

Table 2–3. Estimated 1995 Expenditures for Lagoon-Related Recreation (Millions of Dollars)

Activity	Resident	Visitor	Total Expenditures
Fishing and Shellfishing	$155.2	$43.3	$198.5
Swimming	23.7	112.2	135.9
Boating	49.1	9.5	58.6

[7] The swimming participation rate for visitors seems high, particularly in comparison with the rate for residents at 9 percent. While visitors may correctly report that 55 percent swim in the Lagoon, a potential problem could be that visitors did not distinguish the Lagoon from the ocean and are really reporting swimming in the ocean. This issue is discussed further in Section 3 This high participation rate and possible confusion is reflected in a very high dollar value for visitor swimming, as discussed below and shown in Figure 2–4.

[8] Marine Recreational Fishing Statistical Survey, 1992, developed by the National Marine Fisheries Service. National Oceanic and Atmospheric Administration, with an add-on component titled the University of Florida Participation Survey. See J. W. Milon and E. M. Thunberg, "A Regional Analysis of Current and Future Florida Resident Participation in Marine Recreational Fishing (Report SGR-I 12)." University of Florida, Gainesville, FL: Florida Sea Grant, 1993.

Table 2–3. Estimated 1995 Expenditures for Lagoon-Related Recreation (Millions of Dollars)—Continued

Activity	Resident	Visitor	Total Expenditures
Nature Observation	22.2	65.8	88.0
Water Sports	4.8	N/A	4.8
Hunting	1.5	0.1	1.6
Total Expenditures	$256.5	$230.9	$487.4

The annual total economic value of resident recreational fishing may be approximated by adding the estimated nonmarket access value of $140 million to estimated expenditures of $155.2 million. providing an estimated $295.2 million for the annual total economic value of recreational fishing by residents of the five-county Lagoon region. Adding the estimated visitor expenditures for recreational fishing, $43.3 million, yields an estimated total value for Lagoon recreational fishing of $338.5 million per year. Since this study does not include the Lagoon access value to visitors. $,38.5 million is only a partial estimate of the total economic value of recreational fishing to all anglers enjoying the Indian River Lagoon.

Willingness to Pay for Lagoon Environmental Quality

Perception of Present Lagoon Environmental Quality

In the surveys of residents and visitors, respondents were asked a series of questions intended to elicit their perceptions of the environmental quality of the Lagoon, their opinions of the relate the effectiveness of environmental quality programs intended to improve the quality of the Lagoon. and their willingness to pay for such programs. On a scale of I (excellent) to 7 (very bad). residents rated the present condition of the Lagoon at an average of 4.37. Since 4.37 is significantly above the scale midpoint of 3.5, this average response indicates a public perception that the Lagoon is somewhat deteriorated; moreover, a majority of residents indicated that the Lagoon is either continuing to deteriorate or staying the same.

Nonresident visitors, on the other hand, rated the Lagoon quality at an average of 2.87. significantly lower than the scale midpoint 3.5. This average response indicates a perception that the Lagoon is of above average environmental quality. The majority of visitors also responded that they had insufficient information to judge whether the Lagoon is improving or deteriorating in quality. The results of the two surveys show that residents have a more negative view of Lagoon environmental conditions than those who visit the area for a short time. This may reflect the poorer environmental quality of resources in visitors' home regions and/or a "halo effect" of the vacation experience in which the Lagoon appears highly aesthetic and therefore above average in environmental quality because it is an unaccustomed sight.

Perception of Lagoon Restoration and Improvement Programs

The resident survey included descriptions of three action plans that are composites of several CCMP action plans. The several CCMP action plans were combined into three composites in order to give survey respondents a more complete picture and still stay within the time constraints of the interviews. The survey asked the respondents to give an opinion on the relative effectiveness of those action plans. The composite action plans are:

- Wetlands Protection—described simply as enforcing and supporting conservation measures to limit development of privately owned wetlands;
- Land Acquisition—described as creating a public trust fund to buy and maintain wetlands; and
- Stormwater Management—described as limiting storm water runoff and improving water quality.

The composite action plans are discussed in more detail in Section 3 and Appendix 3-A.

Respondents indicated that they perceive stormwater management most likely to improve environmental quality in the Lagoon. Notably, this priority was consistent across all five counties. Land acquisition was perceived as the least effective plan, consistently across all five counties.

Willingness to Pay for Lagoon Restoration and Management Programs

Resident willingness to pay for the stormwater management action plan was consistent with the indicated perception of the plan's potential effectiveness. The average annual household willingness to pay for stormwater management is $58. The

median value of annual household willingness to pay is $40, the amount that 50 percent of the respondents would be willing to pay for stormwater management. Land acquisition has an average willingness to pay of $33 per household with a median of $29, and wetland protection has an average willingness to pay of $25 per household with a median of $19. Depending upon the action plan, from 68 to 75 percent of respondents indicated their willingness to pay for a program to improve the environmental quality of the Lagoon.

The survey questionnaire also presented the three action plans as "programs," alternatively combining two action plans. Those programs which included stormwater management have higher means and medians than those programs that do not have stormwater management. As discussed in Section 3, the highest respondent annual willingness to pay for such a combination is $66 (median $52) for a combined wetland/stormwater management program Average willingness to pay for a total combined program of all three action plans is $60 (median $30). Overall there are relatively rumor differences between the composite plan alternatives and the total program' suggesting a maximum amount that residents are willing to pay for any program to improve the Indian River Lagoon.

The survey of nonresident visitors asked if they would be willing to pay a special tax on lodging and restaurant bills that would be earmarked for these programs (note that no such tax is presently contemplated). The average willingness to pay per visit by travel group or party is $23 (median $25). Of The 500 respondents, 78 percent indicated they are willing to pay some increase in tax.

Resident and Visitor Passive Use Values

The willingness to pay values for both residents and visitors represent passive use values associated with the Indian River Lagoon. Passive use value represents the preference that individuals may have for natural resources such as the Lagoon that is in addition to current direct uses of the resource. Passive use values may reflect an individual's desire to use the resource in the future, to know that the resource is available for others to use now or in the future, or simply to know that the resource will continue to exist in its present or an improved condition.

In the case of resident willingness to pay, statistical analysis described in Section 3 and Appendix 3-E shows that the estimated values are only weakly related to current direct uses of the Lagoon. suggesting that nearly all of the estimated willingness to pay may be characterized as passive use value. Aggregating the resident respondent willingness to pay across the number of households in the region yields a total estimated annual resident passive use value of $14.6 million to $25.9 million, depending on whether average or median values are used.

Multiplying the mean nonresident visitor willingness to pay across the estimated number of visitor travel groups or parties yields a total of $29.9 million. Statistical analysis of nonresident visitor responses in Appendix 3-E shows that a smaller share of this total may be considered passive use value, as a larger share of their willingness to pay is related to direct use motives than is the case with residents.

Market Value of Commercial Fishing

Over twenty species of commercially valuable shellfish and finfish have traditionally been harvested from the Indian River Lagoon or are dependent upon the Lagoon during some stage of their development. The annual dockside value of the landings of both shellfish and finfish was $12.8 million in 1992 and $17.0 million[9] in 1994.

As of July 1, 1995, gill and entangling nets are prohibited in Florida waters as the outcome of a 1994 voter referendum This study, therefore, considers the market value of only those commercial species which can be legally harvested: clams, blue crab (hard and soft shell), shrimp, and oysters. Of the total 1992 landings, approximately $8.4 million or 66 percent was contributed by these four species. Of the total 1994 Endings, $12.6 million or 74 percent was contributed by shellfish (the increase is due almost exclusively to an increase in clam harvests). The 1994 landings total of $12.6 million is used in this study to estimate the contribution of commercial fishing to the 1995 total economic value of the Lagoon.

Section 6 of this report develops a statistical model based on the historical relationship between submerged aquatic vegetation and shellfish landings. The model is applied to simulate increases in value of shellfish landings based on assumed increases in coverage of the Lagoon floor with submerged aquatic vegetation and increases in the reconnection of mosquito impoundments with the Lagoon. The model

[9] Unpublished data, Florida Marine Research Institute, Florida Department of Environmental Protection.

and projected values can be used to estimate the change in value of the commercial fishery in response to improved water quality and seagrass coverage but are not a direct input to estimating the present, 1995 economic value ofthe Lagoon.

ESTIMATED ECONOMIC VALUE OF THE INDIAN RIVER LAGOON IN 1995

The economic values estimated in this study are composed of:

- Annual expenditures for recreational activity and the nonmarket value of access to the Lagoon for recreational fishing;
- Annual values in terms of willingness to pay for programs to improve Lagoon environmental quality, and the expression of willingness to pay as a passive use value for the Lagoon; and
- The effect of Lagoon riverfront location on the value of residential land.

The economic value of the Lagoon resource is approximated in this study as annual flows of $487.4 million in market expenditures for recreational activities, $140 million in nonmarket value of access to the Lagoon for recreational fishing, $44.5 to $58.0 million in passive use values of those who live and visit the Lagoon, $12.6 million for commercial fishing value and $33 million annually in the incremental value of residential land attributable to riverfront location. The total estimated annual economic value of the Lagoon ranges from $717.4 to $730.9 million, depending upon whether one uses average or median values for estimated passive use value. These values are displayed in Table 2–4.

The annual economic value of the Lagoon is distributed across each of the five counties in Table 2–5. Brevard County clearly enjoys the greatest proportion of the Lagoon's annual economic value at $193.4 million, reflecting both the relatively long shore line and large population of that county. Indian River County has the least proportion of Lagoon annual economic value, consistent with a relatively short shore hoe and small population compared to the other five counties in the Lagoon region. Other demographic characteristics and recreational levels which influence the distribution of economic value across the counties are discussed in detail in Section 3 of this report. The distribution of resident versus nonresident recreational expenditures and activity levels is also discussed in detail in Section 3. Commercial shellfishing estimates across the counties are not available since the data are not collected by the Florida Department of Environmental Protection on a county-by-county basis.

It is important to note that these dollar values are approximations based on statistical techniques that have wide acceptance and use in the field of economics and specifically resource economics. Tables 2–4 and 2–5 thus show an approximate annual economic value of the Indian River Lagoon that comprises the majority of human use and nonuse values for the natural resource.

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Table 2–4. Estimated Total Annual Economic Value of Human Uses

(Millions of Dollars)

Use Category	Value of Resident Use	Value of Visitor Use	Total Use Value
Recreational Fishing and Shellfishing	$295.2	$43.3	$338.5
Swimming	23.7	112.2	135.9
Boating	49.1	9.5	58.6

Table 2–4. Estimated Total Annual Economic Value of Human Uses—Continued

(Millions of Dollars)

Use Category	Value of Resident Use	Value of Visitor Use	Total Use Value
Nature Observation	22.2	65.8	88.0
Water Sports	4.8	Included in boat category	4.8
Hunting	1.5	0.1	1.6
Passive Use	14.6–25.9	29.9–32.1	44.5–58.0
Commercial Shellfishing	12.6	Not applicable	12.6
Riverfront Residential Land	33.0	Not applicable	33.00
Total Lagoon Value	$456.6–467.9	$260.8–263.0	$717.4–730.9

Table 2–5. Estimated Total Annual Value of Human Uses of the Indian River Lagoon in 1995 By County

(Millions of Dollars)

Use Category	Value by County					Region Total
	Volusia	Brevard	Indian River	St. Lucie	Martin	
Recreational Activities:						
Fishing[1]	$ 58.0	$ 124.3	$ 22.2	$ 31.3	$ 50.8	$286.6
Shellfishing	2.5	2.7	0.6	0.2	0.1	6.1
Swimming	6.7	7.6	3.1	2.8	3.5	23.7
Boating	5.6	27.5	3.7	4.9	7.5	49.1
Nature Observation	2.6	9.7	5.7	2.1	2.1	22.2
Water Sports	0	2.1	1.0	1.1	0.5	4.8
Hunting	0	0	1.5	0	0	1.5
Recreational Activities Sub-total	75.4	173.9	37.8	42.4	64.5	394.0
Passive Use (Residents)	4.9–8.7	5.2–9.2	1.2–2.2	1.9–3.4	1.4–2.4	14.6–25.9
Commercial Shellfishing	N/A	N/A	N/A	N/A	N/A	12.6
Riverfront Residential Land	4.7	14.3	4.3	3.2	6.5	33.0
TOTALS	85.0–88.5	193.4–197.4	43.3–44.3	47.5–49.0	72.4–73.4	454.2–465.5

[1]Includes both estimated nonmarket values and estimated expenditures.

ADDENDUM B TO THE WRITTEN STATEMENT OF J. WALTER MILON

"ENVIRONMENTAL SUSTAINABILITY FOR A HEALTHY ECONOMY IN THE INDIAN RIVER LAGOON BASIN"

FOREWORD

The Indian River stretches for 156 miles spanning Volusia, Brevard, Indian River, St. Lucie, and Martin counties. These five counties are currently home to more than one million residents and in 1995 hosted almost 6 million visitors. Last year, residents and visitors enjoyed 24 million recreation days fishing, boating, and swimming in the Lagoon, or otherwise taking advantage of its natural beauty (One recreation day is measured as one person engaged in one activity for one day. While not everyone recreates, those that do, do so often. This is how recreation day estimates can exceed population estimates.) Forecasters expect that future recreational activity in the Lagoon will increase, as more people are drawn to the area's enviable amenities.

Recreation and tourism are important parts of the regional economy that together account for about half a billion dollars a year in purchases of Lagoon-related goods and services. Other uses of the Lagoon bring its total value to more than $730 million a year. These purchases include goods and services supplied by businesses directly related to recreation and tourism, such as surf shops and hotels, and also by businesses that indirectly support recreation and tourism, such as grocery stores and insurance companies. In 1995, Lagoon-based recreation and tourism supported more than 19,000 jobs economy-wide and generated more than $250 million in personal income for residents of the five Indian River Lagoon counties.

Sustaining the Lagoon's economic contribution to the community depends on the continued health and possible enhancement of Lagoon ecology. It is not hard to imagine, for example, that in the absence of management actions, unabated pollution, overuse, and other stressors associated with the two percent annual population growth in the five-county area could quickly degrade Lagoon resources.

The Comprehensive Conservation and Management Plan (CCMP) of the Indian River Lagoon National Estuary Program (IRLNEP) is the blueprint for environmentally sustainable development in the watershed. The CCMP specifically addresses priority problems that threaten environmental sustainability and future recreational opportunities. It offers 69 separate recommendations that are designed to enhance Lagoon resources and support economically important recreational activities, such as fishing, shellfishing, boating, water sports, hunting, swimming, and nature observation. If implementing the CCMP prevents even a 10% decline in the value of the Lagoon, it will sustain more than $70 million a year in economic benefits to the five counties within the watershed.

Preserving the health of the Lagoon is not cost-free. But investment in management actions to sustain or improve the health of the ecosystem are good for the local economy and good for local residents if its benefits exceed its Costs. Since the Lagoon is already relatively clean and its living resources relatively plentiful, it should not be surprising that costs of maintaining and improving this healthy environment are modest.

Implementing the Indian River Lagoon National Estuary Program's CCMP will cost less than $18 million a year, including about $7.4 million a year to continue selected on-going programs ant $10 million a year for new activities such as wetlands creation and stormwater management. This cost is small compared to the extensive investments in the Lagoon being planned by local governments, the state of Florida, and the federal government.

While these costs are reasonable and far less than the benefits one could reasonably expect as a result, it's a fair question to ask whether individuals in one area will pay more than individuals in another. In fan, this turns out not to be the case since costs are spread relatively evenly across the five-county region.

To illustrate the relative cost distribution, we can divide the cost of new CCMP anions assigned to each county by the number of households in each county. The average household in Volusia County would pay the least, $17.66 a year, while the average household in Indian River County would pay the most, $22.61 a year. Households in Brevard, St. Lucie, and Martin Counties would pay $18.44, $20.13, and $22.59 a year, respectively. The types of actions, scale of projects, and number of households determine average costs. The difference between the lowest and highest average household cost is small, about the cost of a sandwich. This result indicates a relatively fair distribution of CCMP costs across the region.

Interestingly, area residents are willing to pay between $52 and $66 a year to implement the CCMP—roughly three times the average cost per household—if CCMP actions result in a healthier ecosystem and additional opportunities to fish, swim, and generally enjoy the Lagoon's resources, according to a survey of 1,000 residents. Tourists also said they want to support CCMP implementation and are willing to pay about $9 a person per visit to improve the quality of the Lagoon. To the extent visitor dollars help support implementation, as they will through sales taxes, average costs to resident households will be less than presented above.

Finding ways to pay for CCMP actions should not delay implementation: benefits are high, Costs are reasonable and distributed equitably, and residents and tourists are willing to pay more. Some $7.4 million in CCMP actions are already financed from a variety of sources including local wastewater and stormwater fees, SWIM funds, property truces, federal grants, and special appropriations of the Florida legislature. These and other, targeted sources of revenue also are effective and efficient ways to finance new and expanded programs.

This document explains why the Indian River Lagoon CCMP's scientifically-based management actions are needed to sustain an environmentally healthy economy well into the next century and shows that CCMP actions are cost-effective and fair. In concise detail, it describes for residents and their elected officials how the CCMP can deliver stronger local economies, increased revenues, and more jobs, even as population grows and stress on natural systems increases. In the years to come, we will point to our resource-rich watershed with pride, knowing that our decisions today sustained a way of life unique to the Indian River basin.

DEREK BUSBY,
Director, Indian River Lagoon National Estuary Program.

A Healthy Lagoon Supports Economically Valuable Recreation and Tourism

More than 1.25 million people live in the five counties bordering the Indian River Lagoon. Last year, another 6 million visited the area. Recreational opportunities and an enviable quality of life afforded by Lagoon resources are a major reason people live in and visit the region.

Lagoon-based recreational activity generates significant local economic value—more than $730 million in 1995. This value is tied to the estimated 24 million recreation days the Lagoon supported last year, 14 million for residents and 10 million for tourists. A recreation day is equal to one person engaged in one recreational activity for a day. This is the same level of activity as the entire population of Melbourne going fishing, boating, swimming, jetskiing, windsurfing, hunting, or manatee watching on or near the Lagoon every day ofthe year.

Recreational uses, along with other land and water-based activities, however, can place stress on the Lagoon ecosystem. Angling can reduce Lagoon fishery stocks, boats can be a source of water pollution, and ocher motorized watercraft can disturb aquatic life in sensitive areas. Surface runoff, discharge from wastewater treatment planes, and improperly managed septic tanks also can impair the Lagoon's health.

Protecting the Lagoon will be critical over the next ten years as more people move to and visit the area. The number of residents in the five IRL counties is expected to increase from 1.25 to 1.54 million between 1995 and 2005. This would be an increase of 24 percent. If the number of visitors increases at the same rate, by 2005 over 7.3 million tourists will be coming to the region each year. At current recreational participation rates, in ten years the Lagoon could be providing almost 30 million recreation days, 6 million more than last year.

CCMP Action Plans

- Point Source Discharges: Ensure compliance with the IRL Act and reduce or eliminate, where possible, industrial wastewater discharges to the IRL.
- On-Site Sewage Disposal: Determine the impacts of onsite sewage disposal on the resources of the IRL and develop and implement strategies to address these impacts.
- Fresh and Stormwater Discharges: Develop and implement strategies to address the impacts of freshwater and stormwater discharges on the resource of the IRL.
- Marinas and Boat Impacts: Engage the boating public and marine industry as active participants in the protection and restoration of IRL rcsources.
- Biodiversity: Develop and implement a coordinated research and management strategy to preserve, protect and restore biodiversity in the IRL.
- Land Acquisition: Develop and implement coordinated strategy to protect environmentally endangered habitats within the IRL basin through acquisition.
- Wetlands: Preserve, protect, restore and enhance the wetland resources of the IRL region.
- Sea Grasses: Protect and restore so grass integrity and function in the IRL by attaining and maintaining water quality capable of supporting healthy submerged aquatic vegetation community to a depth of 1.7 m.

The CCMP is a Blueprint for Environmentally Sustainable Growth

The Indian River Lagoon Comprehensive Conservation and Management Plan, or the CCMP, is a blueprint for preserving Lagoon resources into the next century, and as such, it is a guide for maintaining economic prosperity in the IRL region.

The CCMP embraces the three primary goals of the Indian River Lagoon Surface Water Improvement and Management Plan, or IRL SWIM, a program administered jointly by the St. Johns River and South Florida water management districts. By adopting SWIM goals in its CCMP, the IRL National Estuary Program recognizes the SWIM program's significant planning and restoration accomplishments. The CCMP adds a fourth goal that specifically addresses funding needs.

Indian River Lagoon CCMP Goals

I. To attain and maintain water and sediment of sufficient quality to support a healthy estuarine Lagoon system.

II. To attain and maintain a functioning, healthy ecosystem which supports endangered and threatened species, fisheries, commerce, and recreation.

III. To achieve heightened public awareness and coordination of interagency management of the Indian River Lagoon ecosystem.

IV. To identify and develop long term funding sources for prioritized projects and programs to preserve, protect, restore, and enhance the Indian River Lagoon system.

In 15 separate action plans (see sidebar), the CCMP specifically addresses priority problems that threaten environmental sustainability and future recreational oppor-

tunities. In the absence of management actions tO avoid or minimize such threats, the Lagoon has a limited ability to absorb human stress without degrading. This ability is called carrying capacity.

When an ecosystem like the Indian River Lagoon reaches its carrying capacity, environmental degradation occurs, recreation days decrease, and economic values diminish Fortunately, carrying capacity is not fixed. Management measures, such as those in the CCMP, can reduce stressors, enhance the Lagoon's ability to replenish its resources, and minimize the impacts of development on natural resources.

Within the 15 action plans, 69 separate recommendations are designed to enhance Lagoon resources that support economically important recreational activities, including fishing, shellfishing, boating, water sports, hunting, swimming, and nature observation. The anion plans represent a combination of hands-on restoration work, such as wetlands restoration, impounded marsh reconnection, sea grass planting, and stormwater abatement projects. They also include art array of actions that will strengthen and integrate on-going activities and help make the most of available financial resources.

Many local, state, and federal organizations will help implement the CCMP. The region's five counties—Volusia, Brevard, Indian, St. Lucie, and Martin—as well as the 41 cities in the region will play lead roles. The St. Johns and South Florida water management districts, local water control districts, and other regional organizations, including the Treasure Coast and East Central Florida regional planning councils and the successor to IRLNEP also are key participants. State and federal agencies will help fund CCMP implementation and provide technical assistance. These include the Florida Department of Environmental Protection and Department of Community Affairs, and the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, and U.S. Environmental Protection Agency.

CCMP Action Plans

Impounded Marsh Management: Restore the functions of marshes impounded for mosquito control purposes.

Endangered and Threatened Species: Protect endangered and threatened mammals, birds, fish, reptiles, amphibians and invertebrates of the IRL.

Fisheries: Conserve and protect fin and shell fisheries of the IRL.

Public Involvement and Education: Facilitate implementation of the IRL CCMP through public involvement and education.

Future Implementation: Establish a modified management structure that will oversee the implementation of the IRL CCMP and provide for an organization to support the activities of the modified management conference.

Data and Information Management: Develop and implement a strategy to coordinate the management and dissemination of data and information concerning the IRL.

Monitoring: Develop and maintain a monitoring network which will provide adequate and reliable data and information on water quality, sediment quality and the biological resources of the IRL on which management decisions may be based.

Just How Valuable is the Lagoon? $733 Million a Year

In 1995, the value of Lagoon resources to residents tourists was more than $733 million. The bulk of this amount, $533 million, is counted in direct expenditures, including recreational spending, commercial shellfish landings, and the premium paid for Lagoon-front property. This value is captured in everyday market transactions, such as boat rentals, shellfish sales, and home purchases. These expenditures to not include water-borne commerce, since shipping generally is unaffected by water quality.

The Lagoon's total economic value also includes another $200 million that is not reflexed in market transactions. For example, the value of fishing in the IRL is great enough that anglers are willing to pay more than they currently spend for bait, fuel, and other items.

Additionally, residents and tourists are willing to pay more to improve the Lagoon beyond what they already pay for environmental programs (through taxes). These are often called nonmarket values and they can be estimated and added to values that are more easily measured in market transactions.

Lagoon-Based Recreational Spending Tops $487 Million Annually

Residents and tourists spent more than $487 million last year to enjoy fishing, shellfishing,swimming, boating, other water sports, nature observation, and hunting in and around the Lagoon. Residents spent $257 million while visitors spent $231 million. Total spending levels may be much higher as this figure does not include related purchases of the more expensive recreational equipment that people don't typically buy every year, such as boats or recreational vehicles.

The Lagoon Provided Shellfish Worth Almost $13 Million in 1994

Commercially harvested clams, oysters, crabs, and shrimp were worth $12.6 million at the docks in 1994. Various finfish also contribute to commercial landings, but it has been difficult to calculate their value since July 1, 1995, when the ban on gill and entangling nets went into effect and commercial finfishing practices changed dramatically. Even before the ban, clams, shrimp, and crabs represented more than half of the total value of all commercial fishing.

$825 Million in Property Values Are Tied to the Lagoon

Proximity to the Lagoon adds $825 million to market value of Lagoon-front property relative to non-Lagoon-front property in the five IRL counties. On an annual basis, the Lagoon generates $33 million a year in value for residential landowners. This is because people pay a premium to be on the water for aesthetics and convenience. Market values of riverfront property range from $358 million in Brevard county to $81 million in St. Lucie county, generally reflecting relative length of each county's Lagoon shoreline.

Access to Lagoon Fishing Grounds is Valued at $140 Million a Year

Currently, anyone can fish in the Lagoon free of charge because it is a public resource. That is to say, no organization, public or private, charges an entry fee to fish. Anglers do of course pay modest sums for fishing licenses and boat registration fees. They also pay sometimes not so modest sums for boats, rods, and other fishing equipment. The amount people spend on such fees and equipment generally reflects only part of the value to them of fishing in the Lagoon. In fan, many IRL anglers would be willing to pay more to fish in the Lagoon, up to a certain dollar amount, before they would choose to fish somewhere else.

Collectively, IRL residents are willing to pay up to $140 million more a year than they currently pay to fish in the Lagoon, according to a study prepared for IRLNEP. This value could increase to $200 million by 2010, based on projected population and fishing participation rates.

Individual access values vary by county of residence. The average angler living in Martin county is willing to pay $589 more a year to fish in the IRL system, while the average angler living in St. Lucie county is willing to pay $110 more a year.

Fishing access values are not the only kind of access value that can be calculated. Based on the IRLNEP study, we can expect that residents and tourists also would be willing to pay more than they currently pay for other Lagoon-based recreational activities, such as nature observation and boating. Estimates of these values have not been developed, but they would certainly show that the value of Lagoon resources is substantially higher than the $733 million per year already estimated.

People Would Pay Up to $58 Million More to Protect the Lagoon

Residents care enough about the Lagoon that they are willing to pay up to $26 million more each year to protect its resources. A survey asked 1,000 IRL households about three environmental programs:

Stormwater Management—Residents said they would be willing to pay the most for stormwater management, about SSO per household a year, saying they believe limiting stormwater runoff will result in the greatest water quality improvements.

Land Acquisition—Residents said they are willing to pay about $30 per household a year to create a public trust fund to buy and maintain wetlands.

Wetlands Protection—Residents said they are willing to pay about $22 year to enforce and support conservation measures to limit development of privately owned wetlands.

When presented with a combination of these programs, respondents said they would be willing to pay an average of $60 per household a year, suggesting a maximum amount that residents are willing to pay for any program to improve the Lagoon. Notably, residents are willing to pay the most among three generic programs for the one that is not only an environmental priority but that probably will be most expensive for the region to implement: stormwater management.

In addition to the $26 million residents said they were willing to contribute to Lagoon management, nonresidents said they would be willing to pay up to $32 million more a year to support stormwater management and wetlands protection programs for the Lagoon. A survey of SOO nonresident visitors showed that the average travel party (2.75 people) is willing to pay an additional $23 per party each time they visit the Lagoon if revenues were earmarked for the Lagoon.

The Lagoon Provides 19,000 Jobs and $250 Million in Annual Income for IRL Residents

The Lagoon's value also can be measured by the number of jobs and income associated with Lagoon-based activities, in addition to monetary value of goods, services, and other values.

Lagoon-based recreation currently provides over 19,000 jobs. This is equal to five times the workforce at Patrick Air Force Base, two and a half times the workforce of Harris Corporation, and exceeds the entire workforce of Cape Canaveral, including government employees, contractors, and other on-site workers, by more than 3,000.

Lagoon-based recreation also currently provides $250 million in personal income for area residents. This averages $200 a year per resident, which could buy about 50 pounds of clams.

The CCMP Will Protect Lagoon Values and Create Benefits for the IRL Community

The CCMP will do two things: at a minimum it will prevent further degradation of the Lagoon ecosystem that would have occurred in the absence of its management anions; and it will enhance the quality and/or quantity of Lagoon resources beyond current levels. Both outcomes will provide significant economic benefits to the IRL community.

In economic terms, a benefit is defined as an increase in value or prevention of loss of value. If, as experts expect, the value of Lagoon resources will decline as use increases, preserving any portion of current value constitutes a benefit in the same way that increasing current values creates a benefit.

The potential benefit of the CCMP can be illustrated in the following example. Imagine that the economic value of Lagoon resources will increase 5 percent with implementation of CCMP management actions, but will decrease 5 percent without implementation. The economic benefit of CCMP implementation under these assumptions is 10 percent of the total value (the absolute difference between the two cases). In this example, the CCMP is worth well over $70 million a year (undiscounted) to the local economy.

Recall that by 2005, the Lagoon will be supporting millions more recreation days and the cumulative effects could have significant consequences for the Lagoon. It is not hard to imagine that in the absence of CCMP management anions, pollution, overuse, and other stressors associated with the two percent annual population growth rate projected for the five counties could quickly degrade the Lagoon ecosystem. With the CCMP, resource managers can maintain the Lagoon's carrying capacity and continue to provide the recreational opportunities that residents and visitors have come to expecta.

It is impossible to predict the exact value of the Lagoon with and without the CCMP because our scientific understanding of complex ecological cause and effect relationships is still evolving. Using existing science, CCMP management anions have been specifically targeted to address environmental problems that could threaten economic sustainability. At a minimum, we can be sure that the CCMP will provide an economic benefit for every dollar of value it preserves, as well as every dollar of value it creates. Moreover, it is clear from the analysis presented thus far and continued below that that the IRL community has hundreds of millions of dollars at stake in its quest for environmentally sustainable development.

Economic Gains in Lagoon-Based Recreation and Tourism are Multiplied Throughout the IRL Economy

The economies of the five counties bordering the Indian River Lagoon depend on healthy natural ecosystems for their welfare. Businesses related to fisheries, recreation, tourism, and agriculture generate about $4 billion worth of goods each year within Brevard, St. Lucie, Volusia, Martin, and Indian River Counties. The economic sectors comprising these natural resource-dependent businesses account for about three quarters of the value of all primary goods (i.e., non-service sector) in this region. Manufacturing, including everything from T-shirts to semi-conductors, accounts for the remainder of the non-service sector output.

In turn, much of the construction industry and retail trades depend directly on the primary producing sectors for their livelihood. Hotels, for example, are not built unless tourists want to visit the Indian River Lagoon region. Retail shops depend on residents and tourists to buy their goods; insurance agencies and bankers need local marinas, tackle shops, and other Lagoon-related businesses to buy their services. So in many ways, the regional economy depends on primary economic sectors like recreation, tourism, agriculture, and manufacturing to drive much of the activity in other areas of the economy.

These interrelationships multiply any increase in the value of Lagoon-based recreation and tourism throughout the regional economy, increasing the total impact of CCMP implementation beyond what appears in the recreation and tourism sector alone. Every time residents spend $10 on recreation in the Indian River Lagoon, total sales in the region increase by $12.40. The additional increase results from

spending by businesses like marinas, tackle shops, or grocery stores to buy more goods for their shelves and pay their employees to continue operations.

Every time tourists spend $100 for a hotel room, total sales in the region increase by $192. The additional increase results from hotel owners' purchases of local supplies and services to keep the hotel running. Suppliers to the hotel industry, in turn, reinvest portions of their earnings in the local economy to supply their businesses.

Conservatively, residents and tourists spend $487 million a year on Lagoon related activities, such as fishing, shellfishing, boating, water sports, lodging, and restaurants this figure excludes purchases of boats, recreational vehicles, and other major capital goods). When this level of expenditure ripples through the regional economy, it results in nearly $75O million worth of goods and services.

The tourism and recreation seaors also create thousands of jobs within the five-counry region. For cxarnple, every $1 million in tourist spending on Lagoon-based activities generates between 51 and 56 jobs, depending on whether it is spent in the lodging or retail seaor. Simply preserving the quality of the Indian River Lagoon, therefore, sustains more than 19,000 jobs across all five counties. Enhancing water quality, increasing habitat, or providing additional points of access to the Lagoon can generate thousands more jobs over the next 5 years.

All other things being equal, Florida economists predict IRL economy will grow almost 16 percent between 1995 and 2000, implying an increase of $81 million in the annual value of Lagoon-based recreation and tourism. This presumes that the Lagoon continues to support its current share of the economy. It also presumes that the quality and quantity of Lagoon resources can be sustained, as the CCMP Is designed to do.

Through the multiplier effect described above, an increase of this magnitude will create another $43 million in local trade, for a total impact of $124 million. This level of activity will add more than 3,000 new Jobs to the 19,000 currently supported by Lagoon-based economic acuity. Such additional employment opportunities are comparable to adding another Holmes Regional Medical Center or Rockwell International to the list of local employers.

But What About Costs?

All told, the CCMP will cost slightly less than $18 million a year over the first five years of CCMP implementation (the CCMP planning period is five years). About $7.4 million of this represents Costs for activities and programs that were on-going or planned before the CCMP was developed. The $7.4 million includes more than $5 million for managing fresh and stormwater discharges. Framers of the CCMP included selected ongoing actions in the Plan to highlight important efforts and facilitate integrating new CCMP anions into existing county, special dstra, and other resource management plans.

Costs for new projects a little over $10 million a year. Almost all of these new COStS, $8 million annually, are for technical engineering studies and design work associated with reducing and managing fresh and stormwater discharges. This work lays the foundation for construction projects that will address fresh water and stormwater discharge problems. At this time, COStS of actual construction are still being estimated, but is reasonable to expect the total for the five-county region will total in the hundreds of millions of dollars.

The remaining $2 million in new COStS includes a variety of in-the-ground projects, such as muck removal, as well as a number of new initiatives that will enhance planning and coordination among the Lagoon's many stewards. The relative proportion of existing to new COStS within CCMP action plans varies substantially. This variability is more a function of the organization of actions among plans than necessarily reflexive of past expenditures and future needs in any one area.

Average Costs Per Family Will Be Modest

Bringing CCMP costs down to the household level helps to put them into perspective. If all CCMP COStS, for already planned as well as new activities, were divided equally among IRL households, each would pay $33.81 a year. Existing programs would claim $14.17 and new initiatives would capture the remaining $19.64. Remember that 1,000 IRL households said they would be willing to pay an additional $60 a year to support programs like those contained in the CCMP. The average cost of the CCMP per household is roughly half of what the average household said such programs were worth to them.

The truth is, however, that IRL residents will not bear the full COSt of CCMP implementation. Floridians outside the IRL community will contribute to state programs and water management district projects, through state sales taxes and federal income taxes redistributed to the state in the form of federal assistance. This will reduce the total CoSt of the CCMP to the IRL community. American and for-

eign tourists also will offset some CCMP costs by paying for implementation as sales and other special taxes levied on the goods and services they purchase while in the region flow to government programs.

Costs Are Spread Equitably Across the Five Counties

While COStS of implementing the IRL CCMP are reasonable and far less than the benefits one could reasonably expect as a result, it's a fair question to ask whether individuals in one area will pay more than individuals in another. In fat, this turns out not to be the case since costs are spread relatively evenly across the five-county region.

Together, all new CCMP costs represent less than one half of one percent of each county's total annual personal income. If COStS of new CCMP anions were paid entirely by residents (see above to see how this will not be the case), the average citizen in Volusia County would pay the least, $7.42 a year, while the average citizen in Indian River County would pay the most, $9.50 a year. Citizens in Brevard, St. Lucie, and Martin Counties would pay $7.75, $8.46, and $9.49 a year, respectively.

For all intents and purposes, costs per person are the same in all five counties. The difference between the highest and lowest average cost per person is just barely enough to buy a Big Mac on Sarno Boulevard with nothing left after sales tax, not even for a small soda.

Many Options Exist to Finance the Indian River Lagoon CCMP

Fortunately, paying for the CCMP can be relatively painless, without any need to raid the region's piggy bank. Implementing agencies have already allocated funds for slightly less than half of the Plan's total costs. The IRLcommunity can pay for the remaining $10 million in annual costs with a variety of revenue sources in ways that spread costs equitably, place some responsibility on tourists that enjoy Lagoon resources, and minimize burdens for any one group.

For many CCMP anions, the easiest ways to fund implementation will rely on enhanced revenues from existing sources. To some extent, population growth alone will bring an increase in revenues. For selected sources, however, local officials may want to adjust tax rates and/or fee levels to be more in line with funding needs for targeted activities.

Existing Revenue Sources

- Local wastewater and stormwater utility fees;
- Local general revenues (ad valorem tonics);
- SWIM funds including WMD ad valorem tax revenues and state matching funds;
- Non-SWIM WMD funds, including ad valorem tax revenues, permit fees, state and federal grants and funds from state land acquistion trusts;
- State land acquisition and environmental trust funds such as CARL Preservation 2000, and others;
- State general revenues and sate grant and loan programs Federal hmdinr. including grants from EPA, USFWS, and others.

With existing or new revenue sources, citizens and government representatives typically expect that some relationship exists between a revenue source and the activities it supports. Many believe that individuals and businesses should pay for environmental programs in proportion to their contribution to problems or the benefits they receive from ecosystem protection. While it is not always possible to achieve this goal, several potential funding sources match up well with CCMP anions. One simple funding package is illustrated on the next page.

ONE CCMP FUNDING SCENARIO

This example illustrates how the $10 million in new annual CoStS needed for CCMP implementation could be raised according to the following criteria: (1) Nonresidents pay a reasonable share; t2) A relationship exists between the revenue source and its use; and (3) No single group pays a disproportionate share. These criteria were adopted by the IRLNEP Finance and Implementation Task Force, which oversaw projects to estimate COStS and benefits associated with CCMP actions, and develop a financing strategy. One other criterion was followed for this example: keep it simple.

For convenience, responsibility is split equally between residents and nonresidents—Residents pay $6 million a year and nonresidents pay $4 million a year. This division roughly reflects the breakdown between resident and nonresident Lagoon recreation days: 14 million to 10 million in 1995.

In this example, residents' responsibility is split equally in two $3 million shares to approximate the significance of CCMP costs related to storrnwater management

compared to all other CCMP costs. One share is funded through a storrnwater utility charge and the other is funded through an incremental increase in ad valorem tax rate that the Sr. Johns and South Florida water management districts collect from IRL county residents. Nonresidents pay their share through a single source, a tax on lodging charges.

Revenue source	Annual target	Basis	Rate	Example charge
Stormwater utility charge	$3 million ..	523,865 households	$5.73/HH/yr	$5.73/HH/yr
Ad Valorem Tax through WMDs	$3 million ..	appraised property in 5 IRL counties @ $45 billion.	0.07 mills ..	$10.50/yr for $175,000 house (with $25,000 homestead exemption)
Lodging Tax	$4 million ..	Lodging receipts of $69.2 million.	5.8%	$5.80 on $100 hotel bill

Under one example of this approach, it may be appropriate to fund anions mitigate impeas of marinas and boating on the Lagoon with revenues from sources such as watercraft sales taxes, marine fuel taxes, or boat registration and mooring fees. Similarly, fishing license fees would provide a way for anglers to pay for fishery research and stock management programs.

When CCMP projects will provide services or otherwise generate benefits over a long period of time and require considerable Front capital, as is the case with wastewater treatment plants and stormwater management facilities, it is customary tO rely on loans or bonds. These allow large, up-front COStS to be repaid over time consistent with growth in population and use of Lagoon resources and have the added advantage of distributing costs in proportion to a commuriity's contribution to the problem.

When CCMP anions result in broadly available benefits, broad-based revenue sources are often acceptable funding options. For example, a small increase in the ad valorem tax rate of the water management district could provide additional funds for wetlands restoration, impounded marsh management, land acquisition, or species protection programs.

CONCLUSION

IRENEP's CCMP for the Indian River Lagoon specifies the scientific rationale and management anions needed to sustain an environmentally healthy economy well into the next century. Its actions are Cost-effective and fair. Elected officials should be particularly interested in the CCMP because it can deliver stronger local economies, increased revenues, and more jobs—even as population grows and stress on natural systems increases. In the years to come, we will point to our resource-rich watershed with pride, knowing that our decisions today sustained a way of life unique to the Indian River basin.

ADDENDUM C TO THE WRITTEN STATEMENT OF J. WALTER MILON

STATEMENT OF THE ST. JOHNS RIVER WATER MANAGEMENT DISTRICT

Chairman Chafee and Members of the Senate Environment and Public Works Committee: The St. Johns River Water Management District would like to present a supporting statement for the testimony of Professor J. Walter Milon of the University of Florida The St. Johns River Water Management District has been the state sponsor for the Indian River Lagoon National Estuary Program (IRLNEP), in partnership with the Environmental Protection Agency (EPA), since 1990. During that period, the District has provided over $16 million in support of restoration activities while EPA has provided approximately $5.5 million.

Why has our District expended so much to protect and restore the Indian River Lagoon? The answer is simple—it is a sound investment. Estuaries are the biologically essential, economically priceless, but vulnerable connections between the land and the oceans. The entire nation is served by estuaries. Commercial and recreational fishing, maritime commerce, boating and tourism are just some of the activities that people undertake on and along our coastal waterways.

In an age of shrinking public resources, local officials and citizens (while generally supportive) have increasingly asked about the economic sense of large public expenditures for environmental protection. Until recently, however, it was not possible to illustrate the Lagoon's worth in terms beyond its considerable aesthetic beauty.

With the advent of the Apogee study described by Professor Milon, it became clear that the estimated costs of restoration were dwarfed by the social and economic benefits provided by the Lagoon. These results provided vital information to inform the public about the role of the Lagoon in the regional economy and to rally local political support for the CCMP.

Sustaining the Lagoon's economic contribution to the community depends on the continued health and possible enhancement of Lagoon ecology. It is not hard to imagine that, in the absence of management actions, unabated pollution, overuse, and other stressors associated with the two percent annual population growth in the five counties could quickly degrade Lagoon resources.

The IRLNEP, like other estuary programs within the NEP,has developed a blueprint for environmentally sustainable development in the watershed. The Indian River Lagoon Comprehensive Conservation and Management Plan (CCMP) specifically addresses priority problems that threaten environmental sustainability and future recreational opportunities. It recommends specific actions that are designed to enhance Lagoon resources and support economically important recreational activities, such as fishing, shellfishing, boating, water sports, hunting, swimming, and nature observation.

Admittedly, preserving the health of estuarine systems is not cost-free, but investments in actions to sustain or improve the health of an ecosystem are good for the economy and good for local residents if the benefits exceed the costs. As in many other estuaries around the nation, the Lagoon is already relatively clean and its living resources relatively plentiful. Therefore, it should not be surprising that the costs of maintaining and improving this healthy environment are modest—especially when compared to the likely costs of restoring the Lagoon as additional degradation occurs.

The Apogee study helped to focus on the benefits that improving the Lagoon would bring to the region's residents. Many of these benefits are already being recognized in the form of improved water quality for shellfish aquaculture which is a growing industry in the Indian River Lagoon. Recreational fishing is the largest single sector of human activities documented for the Lagoon. The reconnection of saltwater marshes which were separated from the Lagoon by dikes has greatly enhanced recreational fishing opportunities. One study showed a significant increase in the number of species utilizing reconnected marshes versus those which are impounded. Five species were documented using impounded marshes while over 90 species were recorded using reconnected marshes.

The St. Johns River Water Management District is proud to be playing a role in restoring one of America's most significant waterbodies. Many local and state initiatives are underway to implement the Indian River Lagoon CCMP. Some $17.4 million in CCMP actions are already financed from a variety of sources including local wastewater and stormwater assessments, private grants, and legislative appropriations through the state's Surface Water Improvement and Management (SWIM) program.

We believe that this work has clearly demonstrated the wisdom of investing in the nation's estuaries by showing that the cost of letting degradation occur is high compared to the cost of protecting and restoring our estuaries now. Through the National Estuary Program, our District and the over one-hundred local governments bordering the Lagoon are sharing the responsibility and the rewards of protecting and restoring a beautiful resource. We look forward to the continued involvement and support of our federal partners in this important work without which such progress would not have been possible.

With the above information in mind, the St. Johns River Water Management District fully supports both S. 1321, a bill to reauthorize the National Estuary Program, and S.1222, the Estuary Habitat Restoration Partnership Act. Full implementation of these bills will allow for continued and improved federal support of local efforts to maintain and preserve our natural heritage. The need for this legislation is highlighted by the fact that funding for the individual members of the National Estuary Program has effectively declined over the years as new programs have been initiated and overall funding levels for the program nationwide have remained relatively constant. The increase authorized by S. 1321 and the additional resources projected under S.1222 are critical to local efforts to protect and restore the nation's estuaries.

Thank you for the Committee's interest in the study results presented by Professor Milon and for the opportunity to share our views. Hopefully this information will be useful to the Committee during its deliberations. The St. Johns River Water Management District will be pleased to provide any assistance that the Committee may request as it works to pass this vital legislation.

RESPONSES TO ADDITIONAL QUESTIONS FOR WALTER J. MILON FROM SENATOR CHAFEE

Question 1: Much of what our efforts in the past have focused on, with respect to water quality for estuaries and other waters, is pollution prevention, not habitat restoration. How do you see the two actions, protecting the resource from further degradation, and nursing the resource back to health, interacting to reach the larger goal of improving overall water quality?

Response. The goals of the Clean Water Act of 1972, with refinements in subsequent CWA reauthorizations, to achieve fishable and swimmable waters and to eliminate discharges were useful targets to help the public understand the purpose of pollution control. These goals, however, do not address the issue of what overall level of "ecosystem quality" does the public want for water resources such as estuaries. In this context, ecosystem quality includes not just water quality and fish populations but also other flora and fauna that are dependent on an estuarine habitat. Habitat restoration offers the potential to enhance overall environmental quality in degraded ecosystems and should be considered a logical progression in our national efforts to protect the environment. The problem, however, is that it is often difficult to predict how policies or actions will result in specific habitat improvements and to determine the public benefits from these improvements. In my own research I have found that the public (in this case Florida residents) strongly supports coastal resource restoration proposals if the results of the proposals are clearly defined. Federal policies that promote research on the environmental consequences of habitat restoration actions along with research on public perceptions and expectations about ecosystem health are needed to provide a sound scientific basis to advance our national policy goals beyond water pollution prevention.

Question 2: The results of your study are quite impressive, but because of the warmer climate in Florida, I would imagine that the Indian River Lagoon has longer fishing, recreation and tourism seasons than Narragansett Bay or the Long Island Sound, which would increase the economic benefits of the study. Have any studies been conducted on the economic value of estuaries in colder climates? If so, how do the results of such studies compare with your findings?

Response. The economic value of an environmental resource will clearly depend on the number of people (residents and tourists) who have access to the resource and the quality of that resource. While estuaries in colder climates may have fewer user days than the Indian River Lagoon, larger user populations and higher expenditures can easily compensate. Under the National Estuary Program, several studies have been completed to document these economic benefits. Unfortunately the studies differ in their scope and level of detail so they are difficult to compare. For example, a 1993 study on Massachusetts Bay reported the value of the Bay ranged between $319-$963 million. A 1992 study of Long Island Sound estimated the economic value of fishing and recreation to be more than $5.6 billion. Neither of these studies addressed the property, amenity, or ecosystem values associated with these estuaries. One of the most recent studies, and most similar to the Indian River Lagoon study in scope and detail, was conducted for Peconic Bay on Long Island. This study found that total revenues for estuarine-dependent activities accounted for over $400 million or about 20 percent of the local economy (copies of the study can be obtained from Professor Jim Opaluch at the University of Rhode Island (401/874-4590)). This share of total economic activity attributable to estuarine-dependent activities is strikingly similar to the 17 percent share we reported in the Indian River Lagoon study. Thus, these results support the proposition that estuaries provide a significant contribution to local economies throughout the U.S.

STATEMENT OF TED MORTON, COASTAL PROTECTION PROGRAM COUNSEL, AMERICAN OCEANS CAMPAIGN

Mr. Chairman and members of the committee: Good morning. My name is Ted Morton. I am the Coastal Protection Program Counsel for American Oceans Campaign. American Oceans Campaign (AOC) is a national, non-profit organization based in Santa Monica, California and is dedicated to protecting and enhancing our nation's oceans and coastal resources. I also serve as Chairman of the Aquatic Ecosystems Work Group of the Clean Water Network. The Clean Water Network is comprised of more than 1000 citizen, conservation, labor, religious and other groups nationwide working to improve the quality of streams, rivers, lakes, wetlands, and coastal waters.

Since 1991, American Oceans Campaign has focused a significant amount of attention to the health of estuaries. Working with numerous, dedicated advocates from

estuaries across the nation, we have long-supported making more Federal funds available to improve estuarine water quality and restore estuarine habitats. American Oceans Campaign produced and distributed several public service announcements about the importance of estuaries. We served on the Santa Monica Bay Restoration Project's Management Committee. In April 1996, American Oceans Campaign published Estuaries on the Edge, an examination of the 28 estuaries that are part of the National Estuary Program.

On behalf of my organization and its members, I wish to express my thanks to Senators Chafee and Baucus, and to the other members of the Senate Environment and Public Works Committee, for inviting me to testify today on legislative proposals to improve estuary protection.

INTRODUCTION

Last year marked the 25th anniversary of the nation's premier water quality law—the Clean Water Act. Across the nation, communities used the anniversary to assess the condition of their lakes, streams, rivers, and coastal waters. Many communities discovered that significant progress had been achieved. More lakes and rivers are considered safe for swimming and fishing today, than in 1970. In many estuaries, the acreage of seagrasses and other aquatic vegetation is increasing from levels just a decade ago. Much of the progress is attributed to concentrating on "point source" pollution controls, such as sewage treatment plant and industrial facility discharges. Also, the public is becoming more involved in hands-on, community-wide projects to protect their waters and citizens are letting their elected officials know that they expect clean, healthy waters for their families and communities. These efforts are helping to improve the quality of many water bodies.

But, the examination prompted by the 25th anniversary also revealed we still have much work to do before America meets one of the goals of the Clean Water Act—to make all waters swimmable and fishable. In particular, our coastal waters are troubled. A recent national water quality report disclosed that about 38 percent of the nation's surveyed estuaries are not clean enough to meet basic uses such as fishing or swimming.[1] Many beach waters and shellfish harvesting areas are closed due to pathogen and toxic contamination. In 1995, almost one-third of our nation's shellfish harvesting areas were closed or harvest-limited; polluted urban stormwater was identified as the leading source of pollution contributing to harvest restrictions.[2] Other coastal waters are subject to an increasing number of fish consumption advisories. Finally, estuarine habitat is threatened by unwise development, sedimentation, and destructive fishing practices.

Since last summer, disturbing accounts of our nation's coastal water quality have been featured in the headlines. For example, the outbreak of a toxic microbe, Pfiesteria piscicida, in tributaries of the Chesapeake Bay caused fish kills and human health problems. Red tides along the Texas shore killed an estimated 14 million fish last September and October. Sea turtles with tumors have been found off the coasts of Florida. Sewage spills closed a number of Long Island Sound area beaches last summer. The "dead zone," an area approximately the size of New Jersey where dissolved oxygen levels are too low to sustain fish, continues to appear off the coast of Louisiana and Texas each year. And, El Nino-related storm events overwhelmed sanitation and storm sewer systems in California this winter, causing untreated sewage to flow to the Pacific Ocean and forcing health officials to close numerous beaches.

In order to improve the conditions of estuaries it is imperative to develop and follow a comprehensive national strategy that entails many critical components, including water quality improvements, habitat restoration, smarter land use decisions, public education efforts, and greater investments. I believe that a combination of Senator Chafee's Estuary Habitat Restoration Partnership Act (S. 1222) and Representatives Lowey, DeLauro, and Shays' Water Pollution Control and Estuary Restoration Act (H.R. 2374) provides a significant start to ensure that a comprehensive national strategy for estuary protection is put in place.

THE IMPORTANCE OF ESTUARIES

Estuaries are dynamic bodies of water along our nation's coasts which are formed by the mixing of freshwater from rivers and streams with saltwater from the ocean.

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[1] U.S. EPA, *Water Quality Conditions in the United States: A Profile from the 1996 National Water Quality Inventory Report to Congress* (Washington, DC: U.S. EPA, 1998).

[2] U.S. Department of Commerce, National Oceanic and Atmospheric Administration, *The 1995 National Shellfish Register of Classified Growing Waters* (Rockville, MD: U.S. Department of Commerce, 1997), 7.

Typically, these waters are semi-enclosed by surrounding mainland, fringing wetlands, peninsulas, or barrier islands. Many of the renowned water bodies of the United States are estuaries—Long Island Sound, Chesapeake Bay, Narragansett Bay, San Francisco Bay, and Puget Sound, for example. In addition to bays and sounds, estuaries are commonly known as lagoons, sloughs, bayous, and inlets.

The combination of freshwater and saltwater creates a distinct environment where aquatic plants and wildlife thrive. An abundance of land and ocean nutrients, ample light which promotes the growth of aquatic vegetation, and a continuous mixing of the system by winds, tides, and river inflows create conditions which give life to some of the richest and most productive ecosystems in the world.

In addition, estuaries support a variety of coastal businesses and are valued as places to live and visit. In 1990, it was estimated that 45 percent of the nation's population live in estuarine areas [3]—and the predicted population trends suggest that this percentage will rise in the upcoming years.

The functions and values of estuaries are considerable. For example:

- Estuaries provide valuable commercial benefits. Approximately 28 million jobs are generated by commercial fishing, tourism, water-dependent recreation, and other industries based near estuaries and other coastal waters. [4] It is estimated that commercial and recreational fishing contributes $152 billion to the nation's economy and generates approximately two million jobs. [5]
- Estuaries provide important spawning and nursery habitat for commercial and recreational fish species. More than 75 percent of the U.S. commercial fish catch uses estuaries during at least one stage of life—usually the critical early stages. [6] In the Southeastern United States, 96 percent of the commercial fish catch and more than 50 percent of the recreational catch are comprised of fish and shellfish that are dependent on estuarine and coastal wetlands. [7]
- Estuarine wetlands improve water quality by filtering pollutants before they reach coastal waters.
- Estuarine wetlands and barrier islands protect shorelines and inland areas from coastal storms and flooding. In their natural state, these areas are able to temporarily store large quantities of flood waters and help to minimize damaging impacts of storm events.

MAJOR THREATS TO PRODUCTIVE ESTUARIES

Estuaries are threatened by rapid population growth along the coasts, habitat loss, and pollution. Some of the major problems affecting our nation's estuaries include:

- *Nutrient pollution.* Nitrogen can enter estuaries from a variety of sources, including sewage treatment plants, failing septic systems, combined sewer overflows, polluted runoff from agricultural lands, stormwater, and atmospheric deposition. Excessive loadings of nitrogen disrupt estuarine life by accelerating the growth of algae. When large blooms of algae develop, they block sunlight needed by the estuary's submerged aquatic plants. In addition, as algae decompose, they require such great amounts of oxygen, that other aquatic life are deprived of oxygen. Oxygen-deficient conditions (called hypoxia) can result in massive fish kills.
- *Loss of Habitat.* Due to development pressures and increasing pollution, natural estuarine habitats are being destroyed. Coastal wetlands, mangroves, and submerged seagrasses provide important nursery, spawning, and sheltering areas for fish, shellfish, and other wildlife. Ninety-two percent of the original wetlands base of the San Francisco Bay area has been destroyed. [8] In addition, between 1950 and 1982, seagrass coverage in Tampa Bay decreased from 40,627 acres to 21,647 acres—a 47 percent reduction [9]—because of increased pollution, development and

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[3] U.S. Department of Commerce, National Oceanic and Atmospheric Administration and National Ocean Service, *Estuaries of the United States: Vital Statistics of a National Resource Base* (Rockville, MD: U.S. Department of Commerce, 1990), 1.

[4] Dwight Holling, et. al., State of the Coasts: A State by State Analysis of the Vital Link Between Healthy Coasts and a Healthy Economy (Washington, DC: Coast Alliance, 1995), 8.

[5] William M. Kier Associates, *Fisheries, Wetlands, and Jobs: The Value of Wetlands to America's Fisheries* (Sausalito, CA: Clean Water Network, et. al., 1998), 1.

[6] Elliot A. Norse, Ph.D., *Global Marine Biological Diversity: A Strategy for Building Conservation into Decision Making* (Washington, DC: Island Press, 1993), 65.

[7] U.S. EPA, *Wetlands Fact Sheet No. 2* (Washington, DC: U.S. EPA, 1995).

[8] San Francisco Estuary Project, *Comprehensive Conservation and Management Plan* (Oakland, CA: San Francisco Estuary Project, 1992), 44.

[9] Tampa Bay National Estuary Program, *Charting the Course for Tampa Bay, 1996* (St. Petersburg, FL: Tampa Bay National Estuary Program, 1996), 14–15.

boating activities. The loss of fish habitat is a frequently cited, contributing factor in the severe declines of fish populations along our nation's coasts.

- *Pathogens.* Disease-causing microorganisms, called pathogens, contaminate productive shellfish beds and recreational beach waters in estuaries across the United States. Pathogens are found in animal and human waste and enter estuaries from overburdened sewage treatment plants, raw sewage overflows, agricultural runoff, and malfunctioning septic systems. Eating shellfish or ingesting water contaminated with pathogens can cause a variety of diseases in humans, including gastroenteritis, hepatitis, and others.
- *Toxics.* Often, elevated levels of toxics can be detected in the sediments, the water column, and in the tissues of fish, shellfish, and other organisms that inhabit estuaries. Heavy metals, pesticides, polychlorinated biphenyls (PCBs), and hydrocarbons are the most common toxic contaminants in estuaries. These toxic substances originate from a variety of sources, including agricultural runoff, polluted urban stormwater, automobile emissions, and industrial discharges.

NATIONAL ESTUARY PROGRAM AND CHESAPEAKE BAY PROGRAM AS MODELS FOR COMPREHENSIVE ESTUARY PROTECTION

Estuaries are highly valued and intensely used waters, but only recently were they recognized by Congress as a unique and severely depleted resource requiring special attention. In 1987, Congress added a specific provision to the Clean Water Act (section 117) to provide direction and funding for the U.S. Environmental Protection Agency's (EPA) Chesapeake Bay Program. The Program is recognized for its work on addressing nitrogen pollution and encouraging sound land-use planning.

During the 1987 Clean Water Act reauthorization, Congress also established the National Estuary Program (NEP). The primary purpose of the NEP is to resolve many of the complex issues that contribute to the deterioration of our nation's estuaries.

Governors of coastal states nominate particular estuaries for inclusion in the National Estuary Program. The EPA selects "nationally significant estuaries" to participate in planning activities. After designating a particular estuary, the EPA becomes responsible for convening management conferences to address all uses affecting the restoration and maintenance of the chemical, physical, and biological integrity of each estuary. Conference participants include representatives of the relevant interstate, or regional agencies, Federal agencies, the Governor(s) and appropriate state agencies, local government agencies, affected industries, educational institutions, and citizens. The mission of these conferences is to develop a Comprehensive Conservation and Management Plan (CCMP) that will protect and restore the water quality and living resources of estuaries. The priority actions identified in the CCMP are to be consistent with other provisions of the Clean Water Act and other Federal laws.

The NEP has been, and continues to be a model for outstanding watershed management plans; however, implementation of the plans is more problematic. Over the years, we have discovered as more and more plans are completed, they unfortunately languish on the shelf waiting for the dollars necessary for implementation.

Currently, 28 nationally significant estuaries participate in the National Estuary Program. These estuaries were added in five distinct rounds, or "tiers." Seventeen of the 28 estuaries have completed their plans and are proceeding to implement the identified priority actions. The table on the next page provides a quick summary of the status of the local programs.

Nationally Significant Estuary	Year Designated	CCMP Status
Puget Sound (WA)	1987	Approved 1991
Buzzards Bay (MA)	1987	Approved 1992
Narragansett Bay (RI)	1987	Approved 1993
San Francisco Estuary (CA)	1987	Approved 1993
Albemarle-Pamlico Sounds (NC)	1987	Approved 1994
Long Island Sound (CT, NY)	1987	Approved 1994
Galveston Bay (TX)	1988	Approved 1995
Santa Monica Bay (CA)	1988	Approved 1995
Delaware Inland Bays (DE)	1988	Approved 1995
Sarasota Bay (FL)	1988	Approved 1995
Delaware Estuary (DE, NJ, PA)	1988	Approved 1996
New York/New Jersey Harbor (NY, NJ)	1988	Approved 1996
Massachusetts Bay (MA)	1990	Approved 1996

Nationally Significant Estuary	Year Designated	CCMP Status
Casco Bay (ME)	1990	Approved 1996
Indian River Lagoon (FL)	1990	Approved 1996
Barataria-Terrebonne Estuary (LA)	1990	Approved 1996
Tampa Bay (FL)	1990	Approved 1997
Peconic Estuary (NY)	1992	Expected 1998
Tillamook Bay (OR)	1992	Expected 1998
Corpus Christi Bay (TX)	1992	Expected 1998
San Juan Bay (PR)	1992	Expected 1999
Barnegat Bay (NJ)	1995	Expected 1998
Lower Columbia River (OR)	1995	Expected 1998
Morro Bay (CA)	1995	Expected 1999
Maryland Coastal Bays (MD)	1995	Expected 1999
Mobile Bay (AL)	1995	Expected 1999
New Hampshire Estuaries (NH)	1995	Expected 1999
Charlotte Harbor (FL)	1995	Expected 2000

One of the strengths of the National Estuary Program and the Chesapeake Bay Program is their reliance on a watershed approach to address and solve the problems of the estuary. By identifying, examining, and correcting environmental problems that may originate upstream, the estuary restoration plans and actions have a substantially better chance of success. National Estuary Programs are designed to consider a myriad of issues: stormwater pollution, nutrient enrichment, heavy metals, seagrass loss, wetlands destruction, sewage treatment, industrial discharges, agricultural runoff, fishery landing trends, wildlife populations, land-use practices, and others. Past approaches to restoration and protection have typically concentrated on a narrow examination of a particular type of pollution or a particular species of fish. Although many of these efforts are making progress, a more complete understanding of the cumulative effect of all the estuary's stresses should produce more extensive beneficial results.

Another strength of the programs is the range of participation they attract from interested parties. The Chesapeake Bay Foundation, along with other conservation organizations and many local businesses are actively working to enhance and improve protections for the Bay. The work of NEP Management Conferences provide great opportunities for collaboration and building consensus among the varied interests of the community. Joint decisionmaking during the studying and planning phase, although sometimes difficult to achieve, can lead to far fewer hurdles during subsequent implementation.

ESTUARY LEGISLATION OF THE 105TH CONGRESS

American Oceans Campaign is very pleased with the growing attention that the 105th Congress is paying to the plight of estuaries. At least four bills have been introduced that call for improvements for estuary protection. In addition, several Members of Congress have sought increased appropriations for the National Estuary Program in order to fund implementation actions.

It is my opinion, that the enactment of the Estuary Habitat Restoration Partnership Act (S. 1222), introduced by Senators Chafee and Breaux, and the Water Pollution Control and Estuary Restoration Act (H.R. 2374), introduced by Representatives Lowey, DeLauro, and Shays, would significantly advance a successful, comprehensive approach to estuary protection. The combination of these two bills would foster beneficial estuarine habitat restoration activities; augment efforts to minimize water quality impairment from both polluted runoff and point sources; encourage broad-scale, meaningful public participation in estuary enhancement actions; and authorize substantially more Federal dollars for restoring estuaries and vital estuarine habitat.

The Estuary Habitat Restoration Partnership Act (S. 1222). On September 25, 1997, Senator Chafee, along with several members of this Committee, introduced S. 1222. The objectives of the bill include improving coordination among various Federal and non-Federal estuary habitat restoration programs and increasing the level of Federal funding dedicated to these important restoration efforts. The bill is supported by leading estuary protection organizations across the nation, American Oceans Campaign, and by several other organizations that are part of the Clean Water Network. American Oceans Campaign considers the approach detailed in S. 1222 to be an essential component of a national strategy to improve the health of estuaries.

In particular, the bill will improve efforts to restore estuarine habitat in numerous ways:

It establishes an ambitious, critical goal of restoring one million acres of estuarine habitat by 2010. Numerous commercial and recreational fish and shellfish species use estuarine habitats for nurseries and shelter. Such an increase in estuarine habitat should significantly aid efforts to restore estuarine and marine fisheries to sustainable levels.

It establishes a Federal inter-agency council to better organize the various Federal programs involved in estuarine habitat restoration. The Collaborative Council is to be comprised of the heads of five leading Federal agencies involved in estuary protection and land-use decisions. The activities of the Collaborative Council will increase awareness about estuarine health among key Federal officials and greatly assist coordination and priority-setting. One potential outcome of increased coordination will be the compilation of completed and ongoing restoration plans in the national estuary habitat restoration strategy. A data base that gives a brief account of restoration projects; the types of restoration methods used; the various governmental roles included in the project; and the effectiveness of the restoration will prove to be an invaluable resource for coastal communities that are determined to initiate their own restoration campaigns but unsure of how to start and what to include in a plan.

It promotes a through national approach for restoring estuary habitat. The bill calls for the Council to develop a comprehensive strategy that addresses fish and shellfish, wildlife, water quality, water quantity, and recreational opportunities. Such a strategy should aid in directing scientific and financial attention to the most pressing estuarine habitat concerns, in balancing national attention between small scale and larger habitat restoration projects, and in evening geographical distribution of estuary restoration projects.

The bill encourages community-based involvement by seeking the active participation of concerned individuals, non-profit organizations, and businesses.

The bill authorizes appropriations to carry out estuary habitat restoration projects. The increased investments will allow states to leverage their own contributions to restoration projects and should accelerate and enhance estuary restoration activities.

The Water Pollution Control and Estuary Restoration Act (H.R. 2374). On August 1, 1997, Representatives Lowey, DeLauro, and Shays introduced H.R. 2374. The bill corrects the most glaring weakness of the National Estuary Program—the lack of consistent, adequate Federal funds for implementing approved comprehensive conservation management plans. The bill enables States and local communities to make greater progress in cleaning up estuaries, plus rewards the efforts put forward by the community to develop an action plan for their estuary.

Working through the National Estuary Program (NEP) of the Federal Clean Water Act, community leaders have collaboratively crafted comprehensive estuary management plans (CCMPs) to restore their estuaries. As previously mentioned, seventeen of the twenty-eight estuaries in the NEP have completed their "blueprints" and are trying to implement the identified priority actions.

The NEP provides Federal funding to assist states and local communities in developing watershed plans; however, no Federal funding is specifically allocated to help communities perform the priority actions of the finished plans. To be part of the National Estuary Program, an estuary is considered to be "nationally significant." It should therefore be in the national interest to ensure that plans to restore these waters are implemented and given a proper opportunity for success.

Some coastal states have been successful in securing earmarks through EPA appropriations bills to help support implementation activities. Others have used the existing Clean Water State Revolving Loan Fund (SRF) to fund priority actions of the CCMP; however, this has not proven to be a consistent source of Federal funding for estuary priority actions. To its credit, U.S. EPA has encouraged greater use of the SRF for implementing watershed protection activities through workshops, publications, and missives. Unfortunately, coastal communities continue to struggle in a quest for Federal funds to augment local and state funds for completing priority actions listed in their local CCMP. As a result, the "blueprints" for estuary recovery are not fully being put into action.

Earlier this year, the Santa Monica Bay Restoration Project released a progress report on its restoration plan, which was completed and approved in 1995. Of the 74 priority actions listed in the plan, only eleven have been fully implemented. Lit-

tle or no progress has been achieved on sixteen actions. According to the report, a lack of funding is the primary reason that the clean-up plan has floundered. [10]

H.R. 2374 will strengthen protections for estuaries. The bill:

- requires implementation of approved estuary management plans. Local estuary management plans have been generally successful at identifying water quality problems affecting an estuary. It is essential that the solutions to identified problems are actually carried out.
- assures Federal funding for implementation. The bill extends the State water pollution control revolving loan fund (SRF) through fiscal year 2004. The SRF receives authorized appropriations of $2.5 billion in fiscal year 1998, gradually increasing to $4 billion in fiscal year 2004. The bill requires that states with approved estuary plans set aside a percentage of the SRF increases to be used to implement the priority actions of approved estuary plans. H.R. 2374 creates a State matching requirement for receipt of the Federal funds.
- increases citizen involvement by requiring that representatives of conservation organizations belong to the program's management committee during development of the CCMP. Actively involving citizens in the key decisionmaking arm of the local program will help build support for restoration actions and expenditures that are needed later.
- allows Federal grants to fund select interim actions as local management conferences craft their plans.
- calls for a public assembly to be held and the management conference to be reconvened within 4 years after implementation has begun to gauge the success and status of the plan's implementation.
- extends the authorization of the National Estuary Program through fiscal year 2004.

Because it increases authorization levels for the Clean Water State Revolving Loan Fund, the bill would benefit coastal and inland states. The need for increased funds for water quality infrastructure is particularly great. In 1996, EPA released a national needs survey for water quality infrastructure. Based on reports submitted by the states, the report concluded that the United States will need to spend more than $139.5 billion over the next 20 years to meet capital costs eligible for funding under the SRF. [11] For fiscal year 1999, the Administration requested $1.075 billion for the Clean Water SRF. With the support of American Oceans Campaign, other conservation organizations, water infrastructure associations, and other interested parties, the Senate Appropriations Committee has provided $1.35 billion for the SRF and the House Appropriations Committee has provided $1.25 billion. American Oceans Campaign commends Senators Bond and Mikulski and Representatives Jerry Lewis and Stokes for their strong leadership in increasing funding levels for clean water programs.

If the United States is to narrow the gap between our infrastructure investments and our infrastructure needs, stronger financial commitments from the Federal Government must be made. The Lowey-DeLauro-Shays bill, by significantly increasing Federal contributions to the revolving fund, signals stronger leadership in meeting the future challenges of clean waters.

H.R. 2374 has been the subject of a hearing conducted by the Long Island Sound Caucus, but has not yet received a hearing before the House Transportation and Infrastructure Committee. The bill enjoys bi-partisan support and currently has 20 cosponsors. Last fall, 81 conservation, environmental, fishing, and public interest organizations, representing 23 states and the District of Columbia, joined together in a letter in support of the bill. (Attachment 1) In addition, a coalition of labor and environmental interests, called the Clean Water/Clean Jobs Coalition supports the House bill.

A Senate companion bill to H.R. 2374 has not been introduced. In previous Congresses, Senators Lieberman, Moynihan, D'Amato, and Dodd introduced similar bills to require implementation of CCMPs and assure consistent Federal funding through the State Revolving Loan Fund. During consideration of the Clean Water Act reauthorization in the 103d Congress, much of the Lieberman bill, including requiring implementation of approved plans, and authorizing funds from the State Revolving Loan Fund program, the nonpoint pollution control program, and the National Estuary Program to be used for implementation, was included in the bill (S. 2093) that passed out of this committee.

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[10] Santa Monica Bay Restoration Project, *Taking the Pulse of the Bay: State of the Bay 19989 Executive Summary* (Santa Monica, CA: Santa Monica Bay Restoration Project, 1998), 5.

[11] U.S. EPA, *1996 Clean Water Needs Survey Reprot to Congress, Executive Summary* (Washington, DC: U.S. EPA, 1996).

In an effort to craft a comprehensive national strategy for protecting estuaries and vital estuarine habitat, the Lowey-DeLauro-Shays bill and the Chafee bill complement each other well. The bills support community involvement. The bills reward locally driven processes to determine what vital areas of estuarine habitat to restore and what important actions for water quality improvement to undertake. In addition, they increase the Federal financial commitment to improving water quality and restoring habitat.

The National Estuary Conservation Act (S. 1321). Senator Torricelli introduced S. 1321 on October 28, 1997. The bill permits grants that are authorized under the National Estuary Program to be used to develop and implement comprehensive conservation management plans. The bill also increases the authorized levels for the NEP to $50 million a year for fiscal years 1999 through 2004.

If enacted, Senator Torricelli's bill would set a meaningful advancement for the National Estuary Program. The bill would open the door to using NEP grants for implementation of approved CCMPs.

American Oceans Campaign believes that the Torricelli approach, although a stride in the right direction, can only hope to exact modest improvements in implementing approved priority actions in estuaries. First, an annual Federal allocation of $50 million divided among 28 programs in various stages of their planning and implementation will not fully solve the current problem of inadequate Federal funds available to implement CCMP actions. For all of the programs, the estimated cost their water quality improvement actions substantially exceeds $50 million. A much more significant Federal investment is needed to ensure these plans have a chance for success.

Second, a reliance on NEP grants rather than the state revolving loan fund (as called for by H.R. 2374) to fund implementation activities could lead to a less reliable source of Federal funding. Many of the priority actions identified in the approved CCMPs will take several years to complete. For example, several plans address the need to upgrade or extend sewer service for wastewater treatment and to expand the use of reclaimed water. Having a reliable source of Federal funding to assist states and localities leverage their costs in making these infrastructure improvements should minimize delays and cost overruns, and thus, accelerate the clean up of these estuaries.

Finally, the bill could unintentionally create conflicts between newer programs still involved in developing their CCMPs and older programs needing funds for implementation. Although it is important to support implementation activities, we do not want to squeeze dollars from programs still developing their plans. It is likely that the $50 million will be a future target of earmarks in appropriations bills. The bill needs to address how the distribution between planning and implementing will be equitably carried out.

At the same time, I am concerned that the increased level of authorization might entice EPA to significantly expand the NEP, and not adequately address the great need to support implementation. The pattern of the NEP is to accept additional nominations of estuaries every few years. Between 1987 and 1995, the NEP grew from six estuaries to 28. Certainly there are significant benefits to expanding the number of nationally significant estuaries: an expanded knowledge of estuary conditions in more parts of the nation; stronger public awareness about the need to protect the estuary; increased citizen involvement in planning the restoration of an estuary's vitality; and in the end, an identified, comprehensive list of key actions needed to be taken. However, additional local programs require greater expenditures for administrative, technical, and scientific support.

In summary, local programs need significant and reliable sources of Federal funds to leverage the dollars already being invested by states and localities for implementation of comprehensive estuary management plans. Although S. 1321 does allow NEP grants to be used for implementation activities and increases the authorization level for the program, I believe that to significantly advance the efforts to restore our nation's significant estuaries, a more sizable, comprehensive and dependable Federal funding source is required.

The Coastal Pollution Reduction Act (Mayaguez, Puerto Rico Deep Ocean Outfall Act) (H.R. 2207). Representative Romero-Barcelo introduced H.R. 2207 on July 22, 1997. The bill passed the House of Representatives on November 13, 1997. Section 3 of the bill amends section 320(g) of the Clean Water Act to allow NEP grants to be used for implementation in addition to development of comprehensive conservation management plans. The bill increases the authorization level for the National Estuary Program to $20 million in fiscal year 1998. The bill is silent on extending the authorization of appropriations beyond fiscal year 1998.

Representative Barcelo-Romero's bill corrects the limitation of the National Estuary Program that only allows NEP grant money to be used to support development

activities. However, the increased authorization is only established for one fiscal year and is wholly inadequate an increase to enable significant progress in completing priority activities of approved CCMPs. American Oceans Campaign does not consider this approach to be a comprehensive measure for restoring nationally significant estuaries.

American Oceans Campaign joins with other conservation organizations in Puerto Rico and other national ocean advocacy groups in opposing section 2 of H.R. 2207. This section will allow the Mayaguez publicly owned treatment works to apply for a waiver from secondary treatment requirements and to discharge inadequately treated sewage at a to-be-constructed deep ocean outfall site.

OTHER LEGISLATIVE ISSUES IN THE YEAR OF THE OCEAN

Before I conclude my testimony, I would like to briefly discuss other important legislative issues affecting the oceans. As you know, 1998 has been declared the International Year of the Ocean by the United Nations. To encourage greater ocean protections, American Oceans Campaign is supporting a legislative "Ocean Package" and is encouraging Members of Congress to support and "Vote for the Ocean" in 1998. Key elements of this legislative package include:

The Oceans Act (S. 1213/H.R. 3445). The Oceans Act was introduced by Senators Hollings, Stevens, Boxer, and Kerry, and by Representatives Farr and Saxton. The primary objective of the Oceans Act (H.R. 3445, S. 1213) is to reassess and refine U.S. programs and policies that affect oceans and marine life in order to craft a more coordinated vision for the future. The bill calls for the establishment of a 15 or 16-member national commission to study U.S. policies affecting ocean quality and health, including sustainable fisheries, pollution, transportation, coastal hazards, and exploration. The commission would issue comprehensive recommendations for improving national policies and programs within eighteen months of its establishment.

Current Federal policies and funding to protect oceans and coasts derive from different laws, and responsibilities for safeguarding the oceans are divided among various Federal agencies. Often, the objectives of these laws and agencies conflict. Using the commission's recommendations, directors of the many Federal agencies charged with protecting ocean resources will work with other governmental entities and non-governmental partners to develop and implement a coordinated ocean and coastal policy for the nation.

The Senate has already passed S. 1213. The House bill is currently awaiting a mark-up by the House Resources Committee. We hope that in this International Year of the Ocean, the U.S. Congress will take a strong stand for a national ocean policy and pass the Oceans Act.

The B.E.A.C.H. Bill (S. 971/H.R. 2094). Beaches are the leading tourist destination in the United States. In 1997, California's beaches alone attracted almost 116 million visitors. This summer, many adults and children will swim, snorkel, surf or wade in beach waters that, unbeknownst to them, are contaminated by pathogens that may cause gastroenteritis, dysentery, hepatitis, and various nose, ear, and throat infections.

To protect themselves from harmful pathogens, swimmers must rely on beach water quality tests conducted by local public health agencies. Unfortunately, the testing standards and monitoring practices used by coastal states and localities vary significantly, and often vary within a state. Several states do not regularly monitor their beach waters for pathogen contamination and only a distinct minority of states and local communities consistently notify the public about poor beach water conditions.

The Natural Resources Defense Council conducts an annual survey of public beach closures along our nation's coasts. According to its 1997 report, Testing the Waters, Volume VII, beaches were closed or health advisories against swimming were issued more than 2,596 individual times during 1996. Several of these lasted more than 1 day. These figures underestimate the true extent of the problem since many states to not regularly test beach waters.

To address these problems, Representatives Pallone and Bilbray introduced the Beaches Environmental Assessment, Closure, and Health Act (the B.E.A.C.H. bill), H.R. 2094, last summer. Senators Lautenberg and Torricelli introduced a Senate companion bill, S. 971. The B.E.A.C.H. bill establishes a common-sense, national approach to the problems of inconsistent beach water quality testing and public notification. The bill requires coastal states to adopt water quality criteria for public recreational beach waters that are, at a minimum, consistent with U.S. EPA recommendations. It also directs EPA to work with states to develop monitoring programs that include timely public notification about contaminated beach waters.

Beach visitors have a right to know that the waters they choose to play in are safe for recreation. The B.E.A.C.H. bill promotes a nationwide commitment to ensure beach-goers receive the basic information needed to protect themselves and their families from harmful pathogens.

Essential Fish Habitat. There are currently a number of threats, both regulatory and legislative, to effective implementation of the essential fish habitat (EFH) provisions in the Magnuson-Stevens Fishery Conservation and Management Act. The EFH mandate was overwhelmingly passed by Congress in 1996 in order to address what Members of Congress described as "one of the greatest long-term threats to the viability of commercial and recreational fisheries." The mandate requires that fishery managers describe, identify, and protect areas necessary to fish for spawning, breeding, feeding, and growth to maturity.

Unfortunately, we now understand that some Members of the Appropriations Committees intend to repeal, weaken, issue exemptions for, or eliminate funding for fish habitat protection provisions of the Magnuson-Stevens Act through this year's annual funding process. These Members are responding to pressure from the non-fishing industry sector (including timber, ranching, mining, development, hydropower, and others), which is concerned that the EFH mandate may compromise their short-term economic gain. If these Members succeed in their attempts to weaken, repeal, or debilitate the EFH implementation process, they will have sacrificed a vital public resource to the interests of the private sector.

Clean Water Appropriations. The Clinton Administration's proposed budget for fiscal year 1999 includes a Clean Water and Watershed Restoration Initiative, calling for increases for U.S. Environmental Protection Agency, National Oceanic and Atmospheric Administration, U.S. Department of Agriculture, U.S. Department of Interior, and the U.S. Army Corps of Engineers to prevent polluted runoff, protect public health, and restore waters. American Oceans Campaign fully supports these increases and urges Congress to appropriate these moneys to bring about the needed improvements to our nation's waterways. (Attachment 2)

Polluted runoff is a major source of water quality impairment in coastal waters, rivers, and lakes. Polluted runoff threatens the health of our families and destroys important fish and wildlife habitats. Each time it rains, water runs off the land and picks up toxic pesticides and fertilizers from farm fields and lawns, heavy metals and oils from streets, manure from animal feedlots, metals from mining sites, and sediment from constructionsites, farms, and timber operations. This polluted runoff carries these contaminants into our drinking, fishing, and swimming waters. In addition, sediment buries the underwater vegetation in rivers and coastal waters that sustains juvenile fish and shellfish.

In order to achieve the Clean Water Act's goal of having waters safe for swimming and fishing, we must maximize our efforts to prevent polluted runoff. So far, a few of the Appropriations bills have included significant increases to support the Clean Water and Watershed Restoration Budget Initiative. As members of the committee with oversight responsibilities for many of the clean water programs, I encourage you to continue working to ensure full funding for clean water improvements, particularly in the polluted runoff budgets for the U.S. Environmental Protection Agency and National Oceanic and Atmospheric Administration.

Harmful Algal Bloom Research and Control Act (S. 1480). Last November, Senators Snowe and Breaux introduced S. 1480 to address a serious and growing national problem affecting our coasts. Harmful algal blooms, such as red tides and brown tides, are increasing in severity and frequency along our coasts. Outbreaks of harmful algal blooms can cause fish kills, poison humans and wildlife, close fisheries, and impair the aesthetics and recreational uses of coastal waters. It has been estimated that the annual economic losses associated with harmful algal bloom impacts range from $35 to $65 million.

A similarly significant problem affecting estuaries is hypoxia. Waters that contain low levels of dissolved oxygen are considered to be hypoxic. Hypoxic water conditions do not support marine life and create "dead zones." Off the coast of Louisiana and Texas, a dead zone covering 6,000 to 7,000 square miles (about the size of New Jersey) appears during the summer months. The Chesapeake Bay and Long Island Sound also experience periodic hypoxic conditions.

There is strong evidence linking nutrient loadings with hypoxia and growing evidence associating many outbreaks of harmful algal blooms with an overabundance of nutrients. Measures to restrict the amount of nitrogen being introduced to estuarine and coastal waters from agricultural operations, concentrated animal feeding operations, sewage treatment plants, and atmospheric deposition will assist efforts to control the outbreaks of harmful algal blooms and hypoxia.

The Snowe-Breaux Harmful Algal Bloom bill authorizes additional funds to support ongoing harmful algal bloom research and coastal zone management activities

conducted by the National Oceanic and Atmospheric Administration. Often, these activities involve partnerships with coastal states and universities. American Oceans Campaign particularly supports dedicating additional moneys to assist states in finalizing and implementing coastal nonpoint pollution management programs. These programs provide technical and financial assistance to states to help develop strategies for addressing the threats of polluted runoff in our nation's coastal waters.

Coastal Title to the Clean Water Act. The Clean Water Act was last reauthorized in 1987. During the 103d and 104th Congresses, bills to reauthorize the Clean Water Act were presented for votes (the Senate Environment and Public Works Committee passed S. 2093 in 1994, the House passed H.R. 961 in 1995). Neither of these bills garnered the full support of American Oceans Campaign; however, we were supportive of the addition of stronger coastal protection provisions in a Coastal Title to S. 2093.

In future considerations of the Clean Water Act reauthorization, American Oceans Campaign, along with the Center for Marine Conservation and other coastal advocacy organizations urge Congress to add a Coastal Title to the Clean Water Act. Such a title could be closely based upon the Coastal Title that was added to S. 2093 in the 103d Congress. A Coastal Title should include sections to: strengthen the National Estuary Program (H.R. 2374), establish coastal and marine water quality criteria; devise uniform beach monitoring programs that assures appropriate public notification when waters are too contaminated for safe swimming (S. 971, H.R. 2094); strengthen MARPOL compliance and restrict garbage from ships; ensure the availability of adequate pumpout facilities for recreational boat sewage and marine sanitation devices; and strengthen ocean discharge criteria. I would welcome the opportunity to help put together such a Title.

CONCLUSION

It is time for the Federal Government to do more to advance a comprehensive, national strategy for estuary protection. Efforts of the National Estuary Program have improved the knowledge of water quality problems affecting estuaries and have developed numerous actions that will support the clean up of these waters. Coastal communities, states, and citizen organizations have initiated successful estuary habitat restoration projects and have identified several more projects needing immediate attention.

The approaches contained in the Chafee Estuary Habitat Restoration Partnership Act and the Lowey-DeLauro-Shays Water Pollution Control and Estuary Restoration Act make substantial strides in achieving such a comprehensive strategy. Both bills recognize the important contributions states, localities, businesses and concerned citizens make to improving estuaries. They facilitate inter-agency coordination among various Federal agencies. They reward developing solutions to sometimes difficult water quality and habitat concerns. Finally, they increase the Federal financial contributions to ensure estuaries will remain special, productive places for the future.

I urge this Committee to combine S. 1222 and H.R. 2374 in a subsequent Committee mark-up and work to ensure passage of these important estuary protection provisions by the end of this Congress. I appreciate the opportunity to testify on legislative initiatives to improve estuary protections. I look forward to working with this Committee on these and other estuary issues.

LETTER FROM RESIDENT COMMISSIONER ROMERO-BARCELO

U.S. HOUSE OF REPRESENTATIVES,
Washington, DC 20515–5401, July 6, 1998.

HON. JOHN CHAFEE, *Chairman,*
Committee on Environment and Public Works,
U.S. Senate,
Washington, DC 20510.

DEAR CHAIRMAN CHAFEE: I write you today, as the sole representative of the 3.8 million disenfranchised U.S. citizens living in Puerto Rico to propose an amendment to Section 301 (h) of the Federal Water Pollution Control Act that would allow the Puerto Rico Aqueduct and Sewer Authority (PRASA) to apply for a waiver from certain wastewater treatment requirements affecting its Mayaguez facility.

Under existing law the Environmental Protection Agency (EPA) is not allowed to accept new applications for waivers from secondary treatment requirements. The proposal does not alter the rigorous criteria for issuing a waiver nor does it override

the judgment of EPA. The proposal before your committee reflects the goal of both Congress and the Administration to find innovative, alternative and less costly ways to apply existing statutes without compromising the environmental objectives underlying existing law.

Many scientists and experts agree that plans to construct deep ocean outfalls at locations can provide the best environmental and economic alternative for wastewater treatment. The plans would not only preserve but would even improve the coastal environments where these discharges occur.

PRASA proposes the construction of a deep ocean outfall that would release primary treated wastewater miles from shore at a depth and location that will have no adverse impact on human and marine life.

This alternative would improve the coral environment where the current outfall discharges and would also save the Government of Puerto Rico about $65 million over 20 years that can be spent to address other water supply and infrastructure problems affecting the island.

EPA and the Department of Justice have agreed to enter into a Consent Order with PRASA that provides PRASA the opportunity to apply for the construction of a deep water ocean outfall, which would be an alternative to a secondary treatment plant. However, this alternative cannot even be considered without this legislation; and under the terms of the Consent Order, this alternative can only be considered if this legislation is enacted by August 1, 1998.

If this legislation is enacted, EPA will have a choice as to whether or not to allow the alternative measure. If it is not enacted, there will be no choice, regardless of the environmental or economic consequences. This is what this proposal will accomplish. It is a sound approach to environmental regulations.

It is imperative to stress the fact that this is only a limited and technical amendment that allows PRASA to refile under section 301(h). PRASA would be required by EPA to meet the same stringent legal and scientific tests, conduct the same environmental studies and implement the same monitoring program applicable to existing recipients of section 301(h) waivers. This amendment would not assure that a waiver would be granted; that decision would remain entirely within EPA's discretion.

EPA will be the ultimate decisionmaker, and will determine if PRASA's proposed alternative is feasible and environmentally beneficial. If, after the review, that alternative is acceptable, then PRASA will immediately begin construction of the facility, with the discharge location approved by the EPA. If EPA finds the alternative unacceptable, then PRASA will proceed with the construction of the secondary treatment plant.

Puerto Rico is not asking for preferential treatment. Rather, we are only requesting that EPA balance the cost of constructing a secondary treatment facility against the environmental, economic and social benefits of constructing an outfall at a deep water location.

There are precedents for such limited amendment to section 301(h), most recently for San Diego during the 103d Congress. In the instance of San Diego legislation was enacted to allow EPA to consider a section 301 (h) waiver application proposing a similar alternative to secondary treatment. I believe we deserve the same opportunity to implement an alternative and seek a section 301(h) waiver.

My environmental record speaks for itself. I would not support any measure that I believe compromises our resources or the environment of the island. I urge my colleagues to consider this proposal and its common sense approach. The proposal is limited and targeted, provides for an efficient process, does not modify existing standards and would be implemented by EPA only if environmental and economic objectives are accomplished. I am hopeful that it will receive favorable action in the Senate before the August Is' deadline.

Thank you for your attention to this matter. Should you have any questions please do not hesitate to contact Ruben Padron of my staff at (202) 225–5046.

Sincerely,

CARLOS ROMERO-BARCELO.

STATEMENT OF PERFECTO OCASIO, EXECUTIVE DIRECTOR, PUERTO RICO AQUEDUCT AND SEWER AUTHORITY

Mr. Chairman, my name is Perfecto Ocasio. I am the Executive Director of the Puerto Rico Aqueduct and Sewer Authority (PRASA), the public corporation that serves almost all of the 3.8 million American citizens in Puerto Rico with potable water and wastewater services. Thank you for giving me the opportunity to com-

ment on the need for this legislation, which would benefit the environment and the economy of Puerto Rico.

I would first like to present to the Committee a letter, from Governor Pedro Rossello, urging quick Senate action on H.R. 2207, as a matter of urgent importance to the people of Puerto Rico.

BACKGROUND

Under section 301(h) of the 1977 Clean Water Act, coastal communities, including islands, were permitted an opportunity to apply for an alternative to the requirements of secondary treatment for ocean discharges that met stringent environmental equivalency requirements. All applications were required initially to be submitted to the Environmental Protection Agency (EPA) by December 31, 1982. PRASA submitted seven applications. Six were tentatively approved; only one—the Mayaguez treatment plant outfall—was denied, finally in 1994, because of the location of the outfall in the sensitive coral environment of Mayaguez Bay.

CONSENT DECREE ALTERNATIVES

H.R. 2207, which was passed by the House last October, would allow Puerto Rico to apply to the EPA for authority under section 301(h) of the Clean Water Act to construct a new, state-of-the-art deep ocean outfall at a location that avoids this coral environment. This would be an alternative to secondary treatment at the current outfall location in Mayaguez Bay. This option is specifically embodied in a recent Consent Decree between the EPA and PRASA, which resolves a 15-year-old legal dispute. The Consent Decree, supported by EPA and PRASA, requires PRASA to meet a detailed schedule for the construction of facilities necessary to achieve compliance with all of the requirements of the Clean Water Act.

But it provides two alternatives. One is the construction of a traditional secondary treatment plant, at high cost and energy consumption, which will continue to discharge effluents into Mayaguez Bay. The second alternative, illustrated in the accompanying chart, is the construction of a deep water ocean outfall, sending primary treated effluent several miles offshore into deep ocean currents, thus relieving stress on the Bay and its sensitive coral ecosystems. The deep water outfall could be less expensive to build and much less expensive to operate than a secondary treatment plant. EPA would determine whether the deep ocean outfall meets all Clean Water Act standards. However, because of the urgent need for a solution, the Consent Decree permits EPA consideration of the deep ocean outfall alternative only if Congress authorizes this approach by August 1, 1998.

BENEFITS OF THE LEGISLATION

This legislation provides Puerto Rico the same opportunity that Congress has given other coastal communities in unique situations to implement section 301(h). The bill does not in any way change any applicable standards of the Clean Water Act. Without authority to submit a waiver application to the EPA, PRASA may be required to spend many millions of dollars for a secondary treatment plant that will have no beneficial effect on the stressed marine environment of Mayaguez Bay. These funds could be used for the renovation and upgrade of Puerto Rico's deteriorating water facilities infrastructure and other water supply, treatment and wastewater projects urgently needed in Puerto Rico.

H.R. 2207 makes the following findings:

1. The existing discharge from the Mayaguez publicly owned treatment works is to the stressed waters of Mayaguez Bay, an area containing severely degraded coral reefs, and relocation of that discharge to unstressed ocean waters could benefit the marine environment;

2. The Federal Water Pollution Control Act should, consistent with the environmental goals of the Act, be administered with sufficient flexibility to take into consideration the unique characteristics of Mayaguez Bay; and

3. Scientific evidence suggests that some deep ocean areas off the coastline of Mayaguez, Puerto Rico, might be able to receive a less-than-secondary sewage discharge while still maintaining healthy and diverse marine life.

CORAL REEF PROTECTION

Just last month the President issued an Executive Order on Coral Reef Protection. The legislation also provides Congress and the EPA with an early opportunity to further the goals of this initiative. That Order, which is designed to protect and preserve coral reef ecosystems, requires all Federal agencies to use their authorities to reduce impacts on affected environments from pollution and sedimentation. H.R.

2207 will allow. EPA the opportunity to determine whether a deep ocean outfall can protect Mayaguez Bay. Without this bill, EPA and PRASA have no options—except an inordinately expensive one—a course of action that would continue pollution and sedimentation of the coral ecosystem. This bill does not authorize construction of a deep ocean outfall, it will simply allow us to conclude the necessary studies and complete an application for EPA's review.

ENVIRONMENTAL IMPACT STATEMENT

PRASA is already proceeding to ensure a thorough environmental review of all options. Under Law Number 9, Puerto Rico's local equivalent to the National Environmental Policy Act (NEPA), PRASA and the Puerto Rico Environmental Quality Board (EQB) are preparing an Environmental Impact Statement (EIS). A draft EIS was completed in April recommending a deep ocean outfall as environmentally preferable. A copy of the EIS is being submitted to the Committee.

The entire EIS record will be available to EPA as it considers the strict standards of section 301(h).

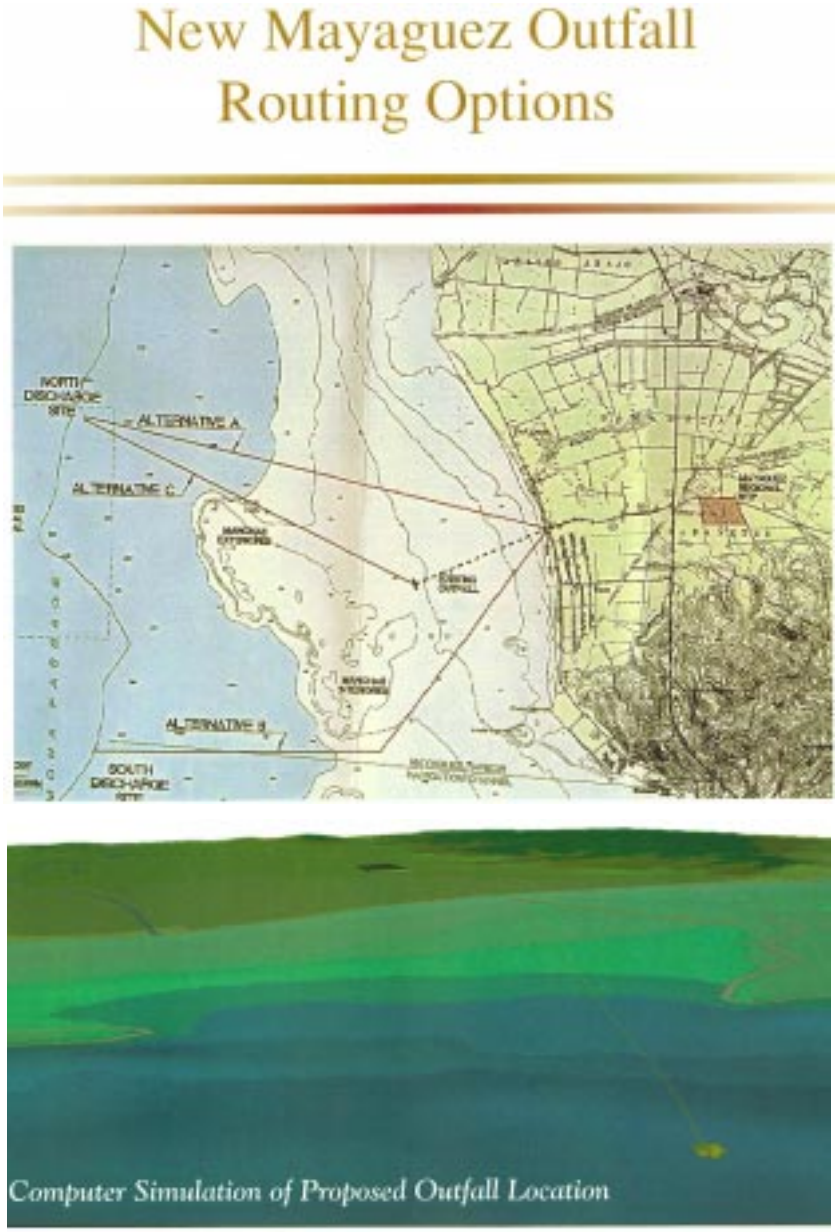
CONGRESSIONAL PRECEDENTS

There are precedents for such a limited amendment to section 301(h). The Municipal Wastewater Treatment Construction Grant Amendments of 1981 included a provision that specifically permitted the city of Avalon, California to file. The 1981 provision concluded: "failure to broaden eligibility risks requiring treatment for treatment's sake, involving the expenditure of funds which could be better used to achieve additional water quality benefits elsewhere. This provision does not grant variances. It simply allows variances to be sought with the burden on the applicant to make his case on environmental grounds."

The Water Quality Act of 1987 also included a specific provision for the Irvine Ranch Water District, a California public agency, that permitted the District to file for a section 301(h) waiver. More recently, in 1994 Congress passed H.R. 5176, which allowed the city of San Diego to apply for a waiver under section 301(h) within 180 days of enactment. This action precisely parallels the provision here.

We urge you to act quickly. A legislative solution must be in place before August 1, 1998. This will allow us to put to rest years of litigation and focus our energies and capital resources on implementing an environmentally sound solution for Mayaguez and other urgent priorities.

Thank you for your time and consideration on this important issue for Puerto Rico.



STATEMENT OF JUAN C. MARTINEZ-CRUZADO, PH.D., MAYAGUEZANOS FOR HEALTH AND ENVIRONMENT

Mr. Chairman: I am Dr. Juan C. Martinez-Cruzado, former President of and spokesperson for Mayaguezanos for Health and Environment, Inc. (MHE). We thank the Senate Environment and Public Works Committee very much for this oppor-

tunity to express ourselves to you, even though we are not constituents of any of you.

Until earlier this week, I had expected to be silent today. Mr. Victor Negron, counsel to the Mayor of Mayaguez, had planned to present testimony on behalf of the government and people of Mayaguez, MHE, and La Liga Ecologica de Rincon. Unfortunately, a last-minute change in circumstances prevented him from appearing today. His written testimony is found on top of the packet that we have presented to the Committee. Accompanying his testimony is a letter from the Mayor of Mayaguez authorizing me to testify on behalf of the Municipality today. My testimony is labelled attachment 1.

MHE is a community-based environmental community organization that formed during our city's successful struggle against the establishment of a coal-fired power plant that was to use 466 million gallons of seawater per day from Mayaguez Bay. We hold our Bay in high regard, and dream of the day in which we may be able to swim again in it without getting skin rashes, ear infections, and other ailments.

We are also involved in other programs aimed at protecting the Bay. For example, we took vigorous action to improve the bay's water quality by filing a citizen suit against the tuna canneries that discharge to the bay and negotiating with them the construction of secondary and tertiary treatment facilities. This was done, I might add, despite the opposition of the government of Puerto Rico.

When H.R. 2207 was introduced in the House of Representatives last summer we opposed it very strongly because it would have given the Puerto Rico Aqueduct and Sewer Authority (PRASA) an opportunity not only to submit a new 301(h) waiver application, but to exempt it from the application revision procedures of section 125.59(d) of title 40, Code of Federal Regulations, thereby eliminating all EPA review criteria and all public participation and, in effect, leaving EPA with no legal basis to deny any new PRASA—301(h) waiver application in Mayaguez. Though that highly objectionable provision has since been removed, we are still adamantly opposed to the bill because it has the effect of retarding by too many years all actions and investments needed to save the coral reefs and improve the water quality of Mayaguez Bay.

We must stress that the history of EPA in Puerto Rico and the Virgin Islands is characterized by indifference and negligence, and a much less pro-environmental position than is generally the case on the mainland. The Agency's handling of—301(h) waivers is a good example. Since that provision was first added to the Act in 1977, more than 200 applications for waivers were submitted. During that 20-year or so span, EPA has made its final determinations on all but seven of those applications. Not coincidentally, the remaining 7 are all in Puerto Rico or the Virgin Islands. In the meantime, partially treated sewage continues to be dumped into the Caribbean and the Atlantic.

As Hispanics, we are very aware of discrimination by EPA, and so we were very pleased that President Clinton signed an Executive Order on Environmental Justice in 1993. However, the problem remains a very real one for us.

In Mayaguez, it took EPA 6 years to conclude its enforcement discussions with PRASA. When they finally produced a consent decree (see attachment 4), EPA had agreed to sit on the law for 1 year, explicitly to give PRASA a chance to weaken the law that EPA is called on to enforce. The agreement of EPA to this provision is regarded by many, including us, as a preliminary approval of the proposed deep ocean outfall, despite the fact that no studies or documentations that supported its viability were available. We were also distressed to learn that EPA had helped draft H.R. 2207. In short, we believe that we have been treated worse than those who live on the mainland. We cannot trust EPA.

Even though EPA concluded 7 years ago that the waters of Mayaguez Bay were already so stressed that no further impairment could be tolerated, PRASA is still discharging the same barely treated wastewater, at the same site, causing the same effects on our beaches and corals. And here we are, now considering turning the clock back to 1979 and giving PRASA another opportunity to engage in a long—301(h) waiver application procedure. The people of Mayaguez, who are sick of waiting for action, can only regard this bill as an excuse to keep doing nothing about the sewage in Mayaguez Bays and an attempt to condemn our coral reefs to a slow death.

The desire for a quick solution to this discharge is so great that even the Governor of Puerto Rico went out of his way in October, 1996, 1 month before the general elections, to promise to the people of Mayaguez the start of the construction of the secondary treatment plant by July, 1997 (see attachment 6). That promise, however, proved to be an empty one.

Last May, PRASA submitted an Environmental Impact Statement (EIS) for the deep ocean outfall to the Puerto Rico Environmental Quality Board (PREQB).

PRASA put in writing and on the map (see attachment 3) the proposed point and depth of discharge. The depth, 400 feet, is within, not under, the thermoclyne, suggesting that the wastewaters will float to the surface, rather than sink to the sea bottom.

The proposed point of discharge is within waters used by humpback whales to mate and give birth, and part of the area used for whale watching activities. It is awfully close to the point where the continental shelf drops off—this area provides critical habitat to massive populations of fish larvae, and is thus a cornerstone of the local fishery.

The proposed discharge point is only 2.5 miles from beaches of Rincon and Anasco, well known as tourism spots and for their surfing activities. Most of the year, strong ocean currents would bring the pollution to those beaches. When cold fronts hit Puerto Rico in the winter months, ocean currents shift to the southeast, where a major coral reef—Manchas Exteriores—would be located 1.2 miles from the point of discharge. As a result, the people of the municipalities of Anasco and Rincon are joining the opposition to this bill. Close to 100 people attended the PREQB public hearings on June 22. Fifteen testimonies, all in opposition, were presented, including testimonies from hotel and parader owners in Rincon, fishermen in Anasco, various people from Rincon, Anasco and Mayaguez, as well as environmental organizations and marine scientists. (see attachment 8).

An engineer presented for a second time a proposal for secondary treatment followed with discharge to existing wetlands for natural tertiary treatment (see attachment 7). Land application of secondarily treated wastewater will be less expensive than deep ocean disposal, and will remove ALL discharges from the sea.

It is crystal clear that the deep ocean outfall is the worst possible solution to a fairly straightforward problem. Undoubtedly, the approval of H.R. 2207 will mean years and years of the current conditions in which our corals are slowly dying and our children can only swim in filth. If passed, H.R. 2207 will only keep Mayaguez in the polluted conditions that it has endured for so many years. We urge you to let H.R. 2207 die.

If the bill is not enacted, secondary treatment will be in operation by 2001, according to the terms of the consent decree. Even though secondary treatment is in itself a mediocre solution, as it provides little relief to corals, this is far better than waiting another decade for PRASA to bicker with, and probably sue EPA over its—301(h) waiver application. In the meantime, our children will be able to swim in safe waters and a sound alternative, tertiary treatment, can be fleshed out.

We hope that this option will have renewed support, given President Clinton's issuance of Executive Order No. 13,089, "Coral Reef Protection." As I'm sure you know, the Order is intended to renew and deepen "the Nation's commitment to preserve and protect the biodiversity, health, heritage, and social and economic value of U.S. coral reef ecosystems and the marine environment." How ironic it would be if the Senate were to approve H.R. 2207, and send it to the President for his signature so soon after the issuance of the Executive Order.

We must bear in mind that when Congress structured the—301(h) waiver opportunity in 1977, it did it so with the clear understanding that the opportunity to seek such waivers would expire in 5 years. In other words, even where a sewage plant operator could persuade EPA that it complied with all of the criteria found in the law, no application for such a waiver could be accepted after December 31, 1 982. On that day, the door closed. Why? Doubtless because Congress recognized that there is something profoundly wrong with dumping barely treated waste into the sea for decades. The 92d Congress was right. The 105th would make a terrible mistake by undercutting the only sound feature of—301(h).

Not long ago, it was commonly believed that the world's oceans were a bottomless receptacle, a universal sink, a resource with no limits. Therefore, it was thought that there was no problem with barging New York City's garbage 112 miles offshore, and dumping it onto the sea floor. The Soviet Union thought there was no problem with disposing of decommissioned nuclear submarines by dropping them onto sea floor. Many people still believe that we can harvest all the fish we please from the world's oceans, because the ocean's ability to produce protein is unlimited.

As this Committee is now very aware, all of these notions have been proven to be tragically wrong. We have come to realize that the oceans are much smaller and more fragile that we once thought. Fueled by population and technological growth, our collective ability to tamper with, if not destroy traditional ecological equilibria increases every year, often with disastrous consequences. We now know better than to think that indiscriminate dumping of waste is harmless. We can no longer claim ignorance as an excuse.

Broadly speaking, there are three ways to deal with pollution; (1) it can be prevented—this is the modern, and most cost-effective approach; (2) it can be treated

after the fact, as most pollution is now handled; or (3) it can simply be dumped, untreated into a dark hole where people do not know what is going on, hoping that the pollution will never come back to haunt us. This is the waste management philosophy of the Cave Men. The Senate disserves Puerto Rico by applying this philosophy to our island, our people, our tropical waters, and the tremendous array of wildlife that inhabit them.

The 92d Congress was right when it closed to door on 301(h) waivers after 1982. The 105th Congress would make a terrible mistake by reopening that door in 1998.

Thank you.

MAYAGUEZANOS POR LA SALUD Y EL AMBIENTE, INC.
Mayaguez, PR, July 10, 1998.

HON. JOHN H. CHAFEE, *Chairman,*
Senate Environment and Public Works Committee,
Washington DC 20510.

Re: H.R. 2207—Section 301(h) waiver for Mayaguez. PR Sewage Treatment Plant

DEAR SENATOR CHAFEE: This follows your question at yesterday's hearing regarding the 12 years that it took EPA to conclude PRASA's failed effort to obtain a §301[h] waiver for the Mayaguez plant. In fact the process took 16 years, because even after PRASA was curtly dismissed by EPA in 1991 (not even a hearing was granted on PRASA's patently deficient applications], PRASA filed administrative and judicial appeals for four more years - all the way to the Supreme Court! The next month they went to Congress for permission to begin the process all over again [H.R. 1371, 94th Cong., introduced March 30,1995.]

Senator Rodriquez's assertion that the Puerto Rico Senate would expedite the next round of paperwork, even assuming that a legislative body could play such a role, is at odds with the hard-ball litigation tactics that were being applied as recently as three years ago.

Having now failed for 19 years to obtain from EPA a waiver allowing it to [1 keep the current discharge where it is, and [23 avoid secondary treatment, PRASA seeks from your Committee what would amount to an open-ended waiver chat would allow the same thing. In the meantime, they could file papers with EPA for another 12, or 16, or 19 years. And the economy of the Mayaguez would continue to bear the burden of EPA's sewer hook-up moratorium.

Twenty-one years ago, Congress wisely set 1982 as the deadline for these waiver applications. The Mayaguez matter is not the right context for taking chunks out of what is probably the nation's most effective environmental law.

Sincerely,

Juan C. Martínez-Cruzado.

GOVERNOR OF PUERTO RICO
June 18, 1998

HON. JOHN H. CHAFEE, *Chairman,*
Senate Environment and Public Works Committee,
Washington, DC 20510.

DEAR MR. CHAIRMAN: By this means I respectfully request your support for H.R. 2207 [the Coastal Pollution Reduction Act], legislation that will permit the Puerto Rico Aqueduct and Sewer Authority [PRASA] to implement a Consent Order that it has signed with the Environmental Protection Agency [EPA] and to apply for authority under the Clean Water Act to construct a deepwater outfall at the Municipality of Mayaguez on the west coast of Puerto Rico. If H.R. 2207 becomes law and if the EPA determines that the environmental standards of the Clean Water Act are met. then PRASA could relocate its wastewater treatment discharges to deep ocean waters. That would eliminate the current discharge site, which is contributing effluents to a sensitive coral environment in the polluted Mayaguez Bay: it would likewise eliminate a deterrent to the region's economic growth, by allowing the EPA to lift its ban on development in the Mayaguez area.

For nearly 15 years PRASA and the EPA have been embroiled in litigation over a solution to the problem of reducing stress on Mayaguez Bay's delicate environment. Throughout the entire duration of my administration, dating back to 1993, EPA has imposed a prohibition on new development in the area because of Clean Water Act violations. Now, finally, PRASA and the EPA have signed a Consent Order that offers two alternatives. The first of these would require the very costly construction of a traditional secondary treatment facility that would continue to dis-

charge wastewater into Mayaguez Bay. The second alternative would entail the construction of a deepwater ocean outfall that would release treated effluent several miles offshore into deep ocean currents. A deepwater outfall would be less expensive to build and much less expensive to operate than would a secondary treatment facility. Should a deep ocean outfall be constructed, the EPA will determine whether it meets all Clean Water Act standards.

However, the process leading to creation of a new outfall - which both PRASA and the Mayaguez community deem to be the environmentally preferable alternative -- cannot commence unless is H.R. 2207 is enacted by August 1, 1998: that is the date which was agreed upon by PRASA and the EPA in their Consent Order, as a means of guaranteeing that a permanent solution would not be delayed indefinitely.

The legislation in question was passed by the House of Representatives last year and has been endorsed by the EPA. Its enactment into law prior to August 1, 1998 would greatly benefit our precious environment, as well as the economic self-sufficiency aspirations of the 3.8-million U.S. citizens of Puerto Rico. Your leadership in the attainment of this urgent objective will thus be deeply appreciated.

Thank you for your kind attention to this very important matter.

Sincerely,

Pedro Rossello.

STATEMENT OF THE ASSOCIATION OF NATIONAL ESTUARY PROGRAMS

Chairman Chafee and Members of the Senate Environment and Public Works Committee: On behalf of the Association of National Estuary Programs (ANEP), we appreciate this opportunity to submit to this Committee our views on protecting and restoring the Nation's estuaries. The Association of National Estuary Programs is a nonprofit organization dedicated to promoting responsible stewardship and a common vision for the preservation of our nation's bays and estuaries. ANEP's citizen members and grassroots supporters are working to ensure that Congress continues to support the tremendous volunteer investment made by citizens, scientists, and local decision makers in developing Comprehensive Conservation and Management Plans (CCMPs) to protect the nation's "estuaries of national significance."

We are pleased that this Committee is turning its attention to the plight of the Nation's estuaries, and offer our endorsement of S.1321, a bill to reauthorize the National Estuary Program, and S.1222, the Estuary Habitat Restoration Partnership Act. Introduced by Senator Torricelli, S.1321 is a bipartisan bill with 18 cosponsors [1] that would reauthorize the National Estuary Program through fiscal year 2004. The National Estuary Program is established by section 320 of the Clean Water Act, and administered by the U.S. Environmental Protection Agency in close partnership with the State and local governments, interested citizens, and the private sector.

It is well established that estuaries are the biologically essential, economically priceless, but fragile connections between the continent and the oceans. The entire nation is served by coastal estuaries in numerous ways such as commercial and recreational fishing, boating, wildlife habitat, transportation, and tourism. Through the National Estuary Program, local governments and interested business and industry groups come together with State and Federal governments to reach agreement on long-term management plans that protect the future economic and biological productivity of our estuaries.

To date, there are 28 estuaries in the national program: Eleven programs are in the developmental stage and 17 are in the implementation stage of their individual "Comprehensive Conservation and Management Plans" (CCMPs). These 28 NEPs contain 45 percent of the nation's surface water area and are downstream from 26 percent of the nation's watersheds. These programs are clearly an important factor in at least a quarter of the nation's inland and coastal watersheds. The management plans for each of these 28 NEPs are each unique, but share many characteristics in that they are all based on sound science, all written by local stakeholder groups in partnership with the relevant regulatory agencies, and all approved by the local and State governments that will be principal partners in implementation. Local citizens guide the development and implementation of their plans, and work to leverage Federal and State dollars with contributions from local governments and the private sector.

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[1]Cosponsors include Senators Graham, Mack, Sarbanes, Lautenberg, Chafee, Reed, Moynihan, Boxer, Kennedy, Kerry, Murray, Faircloth, Landrieu, D'Amato, Gregg, Lieberman, Mikulski, and Cleland.

The Association of National Estuary Programs endorses S.1321. Through its ten years of experience, the National Estuary Program has become an excellent model for developing solutions to complex environmental problems. The 28 programs implement their management plans to improve water quality, habitat, and water flows. Strong federal support is critical. By maximizing the federal investment on the management plans and local partnerships that have been created, the National Estuary Program provides real benefits to the health of the nation's estuaries and the people who live there. S.1321 offers a simple, straight-forward reauthorization of the National Estuary Program.

Through the National Estuary Program, many environmental problems are already improving. A few examples of NEP success stories include:

- The San Juan National Estuary Program is reducing the number of unauthorized raw sewage discharges from boater pump out stations.
- The Massachusetts Bays Program led an interagency approach to shellfish bed restoration that will restore and protect 13 shellfish beds along Massachusetts and Cape Cod Bays.
- More than 32,000 acres of critical habitat area has been preserved in Barnegat Bay, New Jersey. Over 35,000 acres of impounded marsh and mangrove wetlands are being reconnected to the Indian River Lagoon on Florida's eastern coast, one of the most productive U.S. ecosystems.
- The programs in both Corpus Christi Bay, Texas and Tampa Bay, Florida are developing long-term dredged materials management plans to provide environmental protection and to maximize beneficial uses of dredged materials. Tillamook Bay NEP watershed, the largest milk producing region in Oregon, has performed a study that identifies sources of bacteria associated with water pollution and links land use practices to water quality.

The National Estuary Program will be valuable both as a model and as an implementation mechanism for S.1222. Habitat restoration and preservation is critically needed in many of the nation's estuaries of national significance; fish and wildlife habitat loss is one of the greatest problems in our estuaries and it deserves immediate attention and action.

We would like to provide two comments on S.1321. First, we endorse the provision that would allow funding to be used for both the development and implementation of the CCMPs. However, we must express our concern that increasing the State share of funding in the implementation stage from 50 percent to 75 percent because it diminishes the total effort that is needed to implement the CCMPs. Maintaining the current level of federal partnership conveys a commitment that attracts local sponsors and actually assists in leveraging additional local dollars for the projects that improve water quality, enhance wildlife habitat, and conserve water supplies. For this reason we urge the Committee to maintain the State's funding share for implementing the CCMPs at 25 percent.

Second, we applaud S. 1321's authorization of $50 million for this national program. In years past there were just a dozen NEPs receiving around $12 million to develop CCMPs, about $1.0 million per NEP. Unfortunately, today there are 17 NEPs implementing CCMPs with another 11 in the developmental stage while the total funding to the program has not increased proportionally. The increased funding authorized by S.1321 is necessary because there are now 28 National Estuary Programs, and solid federal support is needed to fully advance the mission and goals of each NEP. At the same time, however, S.1321 does not include a provision that we think it should, namely, holding firm EPA's administrative expenses. We want the funding increase to go toward restoring the nation's estuaries - implementing the local programs.

We thank the Committee for providing us the opportunity to share our views with you. The Association of National Estuary Programs stands ready to assist the Committee as it works to pass this vital legislation.

STATEMENT OF RESTORE AMERICA'S ESTUARIES

John Atkin, Stamford, Connecticut, Executive Director, Save the Sound, Long Island Sound.

Will Baker, Annapolis, Maryland, Chairman of Restore America's Estuaries, President, Chesapeake Bay Foundation.

Dery Bennett, Highlands, New Jersey, Executive Director, American Littoral Society.

Peter Clark, St. Petersburg, Florida, Executive Director, Tampa BayWatch.

Mark Davis, Baton Rouge, Louisiana, Executive Director, Coalition to Restore Coastal Louisiana.

Kathy Fletcher, Seattle, Washington, Vice Chair of Restore America's Estuaries, Executive Director, People for Puget Sound.

Doug Foy, Boston, Massachusetts, Executive Director. Conservation Law Foundation.

Todd Miller, Newport, North Carolina, Executive Director, North Carolina Coastal Federation.

Barry Nelson, Oakland, California, Senior Fellow, Save the San Francisco Bay Association.

Linda Shead, Webster, Texas, Executive Director, Galveston Bay Foundation.

Curt Spalding, Providence, Rhode Island, Executive Director, Save the Bay, Narragansett Bay.

On behalf of Restore America's Estuaries, we would like to thank Senator Chafee and the committee for the opportunity to present written testimony in support of the Estuary Habitat Restoration Partnership Act, S. 1222. The members of Restore America's Estuaries welcome the opportunity to express our organizations' strong support and appreciation for Senator Chafee's leadership and vision in introducing legislation that will help our communities preserve and restore our.nation's ' coastal heritage.

Restore America's Estuaries is a coalition off 11 community-based coastal environmental organizations with a combined membership of over 250,000. Our mission is to save and restore America's estuaries and coastal heritage for our children, before it disappears.

Galvanized by their love of our coastal waters, citizens established the R.A.E. organizations to mobilize their communities in protecting these special places. The R.A.E. members have been working for more than 30 years to protect this coastal heritage. Despite the significant accomplishments of the past generation of environmental efforts, we share a deep concern that many species of fish, birds. and other animals are not recovering as we had expected. We are also troubled by the fact that some coastal areas not previously affected by water pollution, are now in serious decline'. These continued problems are caused by the ongoing loss of habitat for fish, birds, shellfish and plants along our shorelines. In order to bring abundant life back to our bays, sounds, and lagoons, our communities must do more than protect the remaining habitat. We must restore the valuable habitats which have been destroyed.

That is what our organizations and their members have been doing over the past three decades. From Seattle, Washington, to Galveston, Texas, to Rockland, Maine, the R.A.E. members have identified and targeted the habitat resources in their own estuaries that are threatened and in need of restoration. Working with school children, neighborhood organizations, and a variety of civic groups, we are helping our communities restore this estuary habitat one acre at a time.

Together, we have pledged to restore one million acres of estuary habitat-by the year 2010. The need is great. in coastal states, 55 million acres of wetlands have been destroyed. We need to turn the tide of this devastating trend and actually foster the rebirth of our estuaries and their life nurturing habitats.

Although, each estuary is unique, they all suffer from significant habitat loss. 92 percent of San Francisco Bay's original wetlands have been destroyed. In Texas, Galveston Bay has lost 85 percent of its sea grass meadows. Louisiana loses 25,000 acres of coastal salt marshes every year, and the Chesapeake Bay's oyster harvests have plummeted from 25 million pounds in 1959 to only a million pounds in 1989 while 90 percent of its seagrass has disappeared. As the pfisteria crisis has demonstrated in North Carolina and the Chesapeake Ray, these losses have dire consequences for our environment, our economy, and our way of life.

When our estuaries suffer these loses of habitats our communities risk the loss of a wondrous heritage and a prized way of life. Estuaries from Long Island Sound to San Francisco Bay are a vital part of what makes our communities special. They serve as the focal points for our community life and traditions, hosting everything from harvest festivals to busy ports.

Joining together land, saltwater, and freshwater ecosystems, estuaries provide a vital link to a healthy environment. Forming a critical buffer between our land and waters, estuary habitat filters pollution from runoff and protects our homes from flooding. Estuaries shelter a tremendous quantity and diversity of wildlife, providing essential habitat for 75 percent of America's commercial fish and shellfish species, 75 percent of the United States' migratory waterfowl and 45 percent of our endangered and threatened species depend upon estuary habitat for shelter' food, and breeding grounds. So, when these habitats are destroyed, the impact is felt far beyond local estuaries as it diminishes our wildlife, water quality and the health of our land.

Estuaries do more than shelter our families and enrich our lives, they are also a valuable economic resource. One acre of estuary habitat produces more food than the richest Midwestern farmland.

Commercial and recreational fishing, boating and tourism provide Americans with 28 million jobs. The fishing industry alone contributes $111 billion to the nation's economy. Our coastal waters welcome 150 million tourists who, in just 6 states, contributed more than $105 billion to local economies during their 1994 visits.

In short, estuaries are national treasures. They nourish.our environment, strengthen our economy, enhance our leisure time, and protect our children's futures. We need to care for our estuaries and invest today to preserve and restore them.

Our communities are already making this investment. They are hard at work restoring small pieces of habitat in estuaries like Tampa Bay, Puget-Sound, and the Chesapeake, but the resources for restoration lag far behind the number of excellent restoration projects available. Senator Chafee's

Estuary Habitat Restoration Partnership Act will provide communities with the resources they need to invest in the health of our estuaries and save our coastal heritage.

Effectively leveraging limited federal resources by matching them with local funding, S. 1222 will restore one million acres of estuary habitat over the next 13 years. This goal will be accomplished by funding voluntary estuary restoration projects which are driven from the community up. Using this coordinated community-based approach, S.1222 gives our communities the tools they need to finish the work they have begun and bring life back to our estuaries.

This legislation goes beyond providing communities with much needed funding. It gives federal agencies the tools to break down the barriers of bureaucracy and work together to build partnerships with local communities. In a recent report, Restore America's Estuaries catalogued 71 different, often overlapping, federal programs which implement some habitat restoration. By creating nets ways for agencies to coordinate their efforts, S. 1222 encourages our governments to make better use of scarce funding and work more effectively. This translates into as much as $10 of on-the-ground restoration for every $1 in new federal funding.

Despite all that's been done, our nation's estuaries remain in crisis. The migration of millions of people to the shores of estuaries has had its impact. Our coastal communities have only a limited rime to take action and reverse this situation. If we do not markedly increase our efforts to restore America's estuaries soon, more species of fish, plants, and birds may become memories just like the Atlantic salmon which once swam in Narragansett Bay, the sea otter which once thrived in San Francisco Bay, and the bay scallops which were once harvested in Long Island Sound. Without action now, jobs will be lost and the quality of life will suffer.

When, last September, Senator Chafee introduced S. 1222, he recognized that the need for habitat restoration is acute and our coastal communities are poised to eagerly respond to this challenge. Restore America's Estuaries applauds Senator Chafee for his leadership on this critical issue. Twenty-six cosponsors, from both sides of the aisle, have also demonstrated that they understand the needs of our estuaries and the coastal communities that depend on them. If we truly want to restore our nation's fisheries, preserve our coastal heritage, and improve our economy, we must give the federal government the opportunity to help with this task.

The coordinated community-based approach prescribed in S. 1222 will also set a powerful example for solving the more complicated environmental challenges of the next century. It will help refocus the Army Corps on the restoration of natural systems, just as is intended in the draft of the Water Resources Development Act (WRDA) that is currently under consideration. Because S. 1222 affects the Army Corps' mission and purpose and because the health of America's estuaries can not afford years of delay, we respectfully urge immediate consideration of S. 1222 as part of this year's WRDA reauthorization.

The Estuary Habitat Restoration Partnership Act presents a vision of great promise. It gives our communities the opportunity to leave our children bays and sounds that are healthier than when we found them. We want to thank Senator Chafee for providing the vision for this bill and setting such a high standard for the future stewardship of our nation's coastal resources.

STATEMENT OF DAVID R. MILLS, CHAIRMAN OF THE BOARD OF COUNTY COMMISSIONERS OF SARASOTA COUNTY, FL

Mr. Chairman: I want to thank you and all the members of the Committee for giving me the opportunity to offer testimony on the status and future of the Na-

tional Estuary Program in general and the Sarasota Bay National Estuary Program in particular.

Estuaries are very important in both environmental and economic terms. They provide habitat for fish, birds and other wildlife. Seventy five percent of the U.S. commercial fish catch depends on estuaries during at least some stage of their life. The fishing industry provides $111 billion to the nation's economy annually and supports 1.5 million jobs. Because of their beauty and intriguing biodiversity, estuaries are also an asset to the nation's tourism industry.

Ironically, some of the things that make estuaries so precious are the very reasons they have become threatened. Due to their natural beauty and hence their popularity, the overall capacity of our nation's estuaries as healthy and productive ecosystems is declining. Increased land development and activity associated with increased population in these areas has, in turn, caused increased stormwater runoff and other discharges that contribute to siltation, increased nutrients and other contamination.

In 1987, Congress recognized the threats to these important coastal areas and included the National Estuary Program in amendments to the Clean Water Act. The purpose of the program is to facilitate state and local governments' preparation of comprehensive conservation and estuaries covered management plans, or CCMPs, for under the program. To date, 28 estuaries have been designated. Section 320 of the Clean Water Act authorized the EPA to make grants to states to develop their plans. However, the law does not provide for resources to facilitate implementation of the plans and 17 of these 28 plans are already complete.

One of the plans that has been completed is for Sarasota Bay in Sarasota County, Florida, the county I serve. While each of the estuaries in the National Estuary Program is unique in terms of their physical attributes and their diverse inhabitants, they are equally unique in the varying threats that are posed to them. A common estuary pollutant in Sarasota Bay is nitrogen, an overabundance of which causes increased growth of algae. The algae reduces light penetration to the other organisms in the water and, through chemical and biological processes, depletes the water of oxygen. It has been determined that the amount of nitrogen in Sarasota Bay has tripled since intensive development began. The source of the increased levels of nitrogen in the Bay has been both small and large wastewater treatment plants, groundwater contaminated by septic systems and fertilizers used in lawn care and agriculture. Without remedial action, the EPA claims that the nitrogen level would increase 16 percent in the next 20 years when the area is fully developed according to existing plans. However, by implementing the restoration plan for Sarasota Bay, these levels of nitrogen can be 23 percent lower than they are today.

In addition to the introduction of nitrogen into estuaries, surrounding development has also introduced an array of viruses, bacteria and parasites that can pose a threat to swimmers, surfers, divers and seafood consumers. Sources of these microbial contaminants include leaky septic tanks, boat and marina waste, recreational vehicles and campers, animal droppings, combined sewer overflows and urban and agricultural runoff. Fish and filter feeding organisms such as shellfish can concentrate these pathogens in their tissues and can cause illness to people who consume them. As a result, shellfishing areas and bathing beaches are often closed. Several estuaries are experiencing contamination problems that require extensive research into their origins and effects, such as the toxic microbe Pfiesteria piscicida, which has broken out in rivers that drain into estuaries in Maryland and Virginia.

Phillippi Creek, which feeds into Sarasota Bay, is posted with warning signs of the potential health risks associated with exposure to its waters. Scientific studies done on Phillippi Creek have shown the presence of fecal coliform and human viruses. There are 7,500 septic tanks along Phillippi Creek that will have to be replaced with a central wastewater treatment system in accord with the proposed plan at a cost of some $100 million.

The plan that has been developed for the Sarasota Bay Estuary is an integral one that seeks to stem environmental impacts and enhance natural systems. Most past environmental regulatory efforts in Florida have concentrated on the larger, regional wastewater treatment plants. While these programs have been successful in reducing nitrogen loads from those facilities, the 45,000 septic tanks and the 55 small wastewater treatment plants in the Sarasota County area contribute nearly twice as much pollutant as the regional facilities, despite handling less than half of the volume. Since the focus has not historically been on septic tanks and smaller facilities, that is where the biggest problem lies, especially for Sarasota Bay. The Sarasota Bay NEP's overall recommendation for this problem is the aforementioned replacement of a significant number of these tanks with a central wastewater treatment system along Phillippi Creek as well as other small treatment plants.

Additionally, the Sarasota Bay CCMP calls for revised regulation of septic tanks and small wastewater treatment plants, programs to reduce the use of fertilizers and pesticides in the area, using artificial reefs as fisheries to replenish marine populations and restoring the intertidal wetlands. Effectively managed recreational use of the Bay is also recommended, as it will foster a sense of stewardship for the estuary with both tourists and residents alike.

S. 1321 will take the next step by giving EPA the authority to make grants for plan implementation and authorizing annual appropriations of $50 million. There is also language in this bill that emphasizes and insures that the program remain a partnership with a matching requirement so that the funds will be available to upgrade sewage treatment plants, fix combined sewer overflows, control urban stormwater discharges and reduce polluted runoff into estuarine areas. We in Sarasota are committed to this partnership. Last November, a 1 percent sales tax levy was passed to generate funds and we already have preliminary engineering work underway for this project. In other words, we come to Washington ready, willing and able to shoulder our share of the partnership envisioned by s. 1321.

In closing, Mr. Chairman, I respectfully request your assistance and that of all the members of this Committee to ensure the preservation of our nation's estuarine areas not only as a natural wonder, but also as an environmental and economic asset to the regions in which they exist. Thank you again for the opportunity to submit our views on this important issue.