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BALLAST WATER INVASIVE SPECIES MANAGEMENT AND THREATS TO CORAL REEFS

HEARING

BEFORE THE

SUBCOMMITTEE ON NATIONAL OCEAN POLICY STUDY

OF THE

COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION UNITED STATES SENATE

ONE HUNDRED NINTH CONGRESS

FIRST SESSION

JUNE 15, 2005

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ONE HUNDRED NINTH CONGRESS

FIRST SESSION

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BALLAST WATER INVASIVE SPECIES MANAGEMENT AND THREATS TO CORAL REEFS

WEDNESDAY, JUNE 15, 2005

U.S. SENATE,
SUBCOMMITTEE ON NATIONAL OCEAN POLICY STUDY,
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,
Washington DC.

The Subcommittee met, pursuant to notice, at 9:32 a.m. in room SR–253, Russell Senate Office Building, Hon. John E. Sununu, Chairman of the Subcommittee, presiding.

OPENING STATEMENT OF HON. JOHN E. SUNUNU, U.S. SENATOR FROM NEW HAMPSHIRE

The CHAIRMAN. Good morning. I want to welcome everyone to the first meeting of the National Ocean Policy Study in approximately 10 years. This is a group that was created in 1974 that has had fairly limited activity since 1994 but it's, obviously, a very important mission. The National Ocean Policy Study is designed to investigate the very diverse and incredibly complicated world that covers 70 percent of the Earth's surface. I'm pleased to be joined by Senator Boxer who is the Ranking Member of the Policy Study, and I see Senator Inouye is here as well. I will submit my opening statement for the record because we do have the vote scheduled at 10 o'clock. I hope to move things along. That will give us ample time to take all of the witnesses' testimony, and at least begin a question period. I want to, before I turn it over to Senator Boxer, ask unanimous consent that Senator Allen be allowed to submit a statement regarding Nutech of Arlington, Virginia. I know that Dr. Celia Smith of the University of Hawaii was also unable to be here and has asked that a statement of hers be submitted for the record. And without objection these statements and the full written testimony* of all of our witnesses will be added to the record, and at this time, I will turn it over for opening remarks to Senator Boxer.

[The prepared statement of Senator Sununu follows:]

PREPARED STATEMENT OF HON. JOHN E. SUNUNU, U.S. SENATOR FROM NEW HAMPSHIRE

Good morning, and welcome to the first meeting of the National Ocean Policy Study in over a decade. Created in 1974, but dormant since 1994, the National Ocean Policy Study is designed to investigate the rich, diverse, and incredibly complicated world that covers 70 percent of the Earth's surface.

*The information referred to has been printed in the Appendix.

The ocean is our most plentiful and important natural resource. According to the U.S. Commission on Ocean Policy, ocean-related activities directly contribute over $117 billion a year to the U.S. economy each year and supports over 2 million jobs. Our Nation's ports handle $700 billion a year in merchandise, the offshore oil and gas industry is valued at nearly $40 billion, and the fisheries industry is valued at close to $50 billion.

We need to be good stewards of our oceans, protecting them for future generations as we enjoy the benefits they offer today. It is my hope that the National Ocean Policy Study can explore some of the many challenges we face in maintaining that balance.

Today's hearing covers two very different topics, ballast water invasive species management and threats to coral reefs.

Along with the $700 billion in merchandise they move, cargo ships going to and from American ports also carry small stowaways. These uninvited plants and animals hitch a ride around the globe, only to be dumped in a new home when a ship empties its ballast tanks. Many of these species are quickly killed in their new environment, never to be heard from again. But some find their new home a virtual paradise, with plenty of food, few competitors, and no natural predators. These nonnative species do what any creature would do in a similar setting; they thrive, creating a potentially harmful impact on their new ecosystem. Today, we'll look at policies designed to prevent these invasive species from making their long journey to a new home, or at least from surviving it.

The Coral Reef Conservation Act of 2000 is set to expire this year. Senator Inouye plans to introduce legislation shortly to reauthorize this program, taking into account what we've learned about these complex and fragile systems in the past five years. It is my understanding that Senator Inouye will also incorporate some of what we learn today.

I would now like to recognize the Ranking Member of the National Ocean Policy Study, the Senator from California.

STATEMENT OF HON. BARBARA BOXER,
U.S. SENATOR FROM CALIFORNIA

Senator BOXER. Thank you, Mr. Chairman, very much. I will also submit my statement for the record if there's no objection. But I would like say just one or two things in summary of it.

First of all, I am so delighted that we have this subcommittee and that you are chairing it, and I, you know, I had a choice of which subcommittees I would work on and this was the one I selected because of my love of the oceans and also I feel very strongly that you and I can work well together. I also want to say how proud I am of Senator Inouye and that at this first hearing we're going to be discussing one of his priorities, this very important bill that I strongly support. And my last point is as I've detailed in the statement that we'll not go through I have written a bill, a comprehensive bill, on ocean protection that was inspired by the two commissions, the Pew Commission and the U.S. Commission on the Oceans. And in that bill, basically, is almost detail for detail this particular bill by Senator Inouye, so I couldn't be more pleased about this and I hope that we can move forward because I understand that my comprehensive bill, which we have shared with your staff at length, and with the staff of Senator Stevens and Senator Inouye, is very broad and has some controversy, I'm not unmindful of that, but if we could look at bit by bit, piece by piece, look at the things you want to do, look at the things I want to do and all the members of the Committee, I think we can have a great year for oceans because as Jacques Cousteau's grandson said at this press conference I had, the oceans need our help, they're in crisis right now. And so there's not a lot of time, we should act soon. So thank you very much. I, again, look forward to working with you.

[The prepared statement of Senator Boxer follows:]

PREPARED STATEMENT OF HON. BARBARA BOXER, U.S. SENATOR FROM CALIFORNIA

Thank you, Mr. Chairman, and may I begin by saying how pleased I am to be serving as your Ranking Member and that we are holding our first hearing.

By reestablishing this Subcommittee, Congress is again acknowledging the importance of the oceans to our Nation's and the world's health, and to the economy, and how important it is to understand and act to lesson the threats to our oceans.

That was underscored twice in the last two years with the release of two separate reports by two distinguished Commissions—the U.S. Commission on Ocean Policy, headed by Admiral Watkins, and the Pew Ocean Commission, headed by Leon Panetta.

Last week, I introduced comprehensive legislation, the National Oceans Protection Act, to implement the recommendations of these two Commissions.

Mr. Chairman, I look forward to a good working relationship with you and the other members of this subcommittee, and I hope we can approve good oceans legislation in this Congress.

It is appropriate that the first two issues on deck are combating aquatic invasive species and protecting coral reefs.

Harvard's E.O. Wilson, one of the world's greatest living biologists, says that invasive species are second only to loss of habitat as the causes most destructive to biodiversity.

Invasive species destroy habitat, attack native species, and upset the ecological balance that has been in place for thousands and thousands of years.

In San Francisco Bay alone, more than 175 invasive species threaten to overwhelm native fish and other wildlife—and, nationally, the total economic damage of invasive species is estimated to be $137 billion each year.

One of the most common causes of invasive species is ballast water from ships, which brings water from around the world—including a host of creatures—into America's waters.

My comprehensive oceans bill includes new regulations on ballast water, including prohibiting nearly all discharges into U.S. waters. My bill also addresses the need for early detection and rapid response, including assisting states in combating invasive species.

I commend Senator Inouye for introducing the Ballast Water Management Act. I appreciate his leadership on this issue, and I look forward to working with him.

The other subject of this hearing is coral reefs. Coral reefs are critical habitat for ocean creatures and are home to potential cures for human ailments. They have been called the rainforests of the seas.

But warming seas and warming climate, water pollution, and harmful fishing practices threaten the world's coral reefs.

We must reauthorize the Coral Reef Conservation Act of 2000, which was an important start in promoting scientific research and sound management of our coral reefs. But we must go further.

My oceans legislation contains important provisions to preserve critical coral habitat, including creating Coral Management Areas to provide a higher level of protection.

I look forward to working with my friend, Senator Lautenberg, one of the Senate's true champions for our coral reefs, and other members of the Committee to advance protections for coral reefs this Congress.

Again, Mr. Chairman, I am very pleased to be your Ranking Member, and I look forward to the testimony of the witnesses.

The CHAIRMAN. Thank you, Senator Boxer, and I appreciate the work that you've done on the legislation you've introduced. It is a very comprehensive bill, no question about that, but I think there are a number of elements that we can and will address through the Policy Study, and very much look forward to working with you to identify those pieces. But I think we're starting with a good one, the issue of invasive species and the role that ballast water plays in spreading those invasive species to places they, obviously, are not desired and can be very harmful. And with that, I'd like to turn it over to Senator Inouye for any opening remarks he might have.

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

Senator INOUYE. Mr. Chairman, I thank you for calling this hearing. It's very important. When one considers that 70 percent of this planet is water and we spend less than 5 percent of the funds studying the ocean and 95 percent studying space, something's wrong. At the same time, when one considers that about 85 percent of all the coral reefs within the jurisdiction of the United States are found in the Hawaiian chain, that's a major concern to us. In addition, billions of gallons of ballast water are literally being dumped in our ports annually. If it was just the water, that's one thing, but these ballast waters contain invasive species, and so they're all over the world now. We have experienced species going extinct in our area and we want to do something to stop that. I ask that my statement be made part of the record. Thank you very much, Senator.

[The prepared statement of Senator Inouye follows:]

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

I would like to join our Chairman in welcoming our distinguished panel of witnesses today, and to thank him for holding this important hearing. I would like to particularly welcome Ms. Kim Hum, of The Nature Conservancy of Hawaii, to the hearing and to thank her for her work on coral reef conservation in the Pacific.

Unfortunately, I am all too familiar with the problems of invasive species and threats to coral reefs. In my home State of Hawaii, the two often go together. The impacts of such alien species on our native species have been among the most significant in the country.

The United States Ocean Commission recognized the problem of invasive species as one of the greatest threats to coastal environments. Invasive aquatic species have been found in all regions of the United States, including most of the states represented on this Committee. Invasive species are thought to have been involved in most of the extinctions of native aquatic species.

The Commission also called for expanded national and international action to address increasing threats to coral reefs, including those posed by invasive species.

Ballast water from ships is one of the largest pathways for the introduction and spread of aquatic invasive species. It has been estimated that some 10,000 non-indigenous aquatic organisms travel around the globe each day in the ballast water of cargo ships, and billions of gallons of ballast water are discharged in U.S. waters each year. The problem is not only from ballast water, but also invasive species that travel on the hulls and other parts of ships.

The direct and indirect costs of aquatic invasive species to the economy of the United States are also staggering, and have been estimated to amount to billions of dollars per year. We need to find a solution to this problem, while at the same time ensuring that our maritime industry can continue to operate in a cost-effective manner.

Existing law does not provide the legal authority needed to effectively address this problem. That is why I introduced the Ballast Water Management Act of 2005. The bill establishes standards for ballast water treatment that will be effective, but on a schedule that our maritime fleet can realistically achieve. It recognizes safety as a paramount concern, and allows flexibility in ballast exchange practices to safeguard vessels and their passengers and crew.

Looking to the future, the bill will also encourage the development and adoption of new ballast water treatment technologies, as well as innovative technologies to address other vessel sources of invasive species such as hull fouling, through a grant program.

Coral reef resources are, of course, central to life in Hawaii, where we rely on them to sustain our fisheries, attract and retain tourism, and protect our coastal communities during extreme weather events. Reef-related tourism and fishing activities directly generate $360 million each year for Hawaii's economy, and coral reefs are the lynchpin for Hawaii's entire tourism industry, valued at over $10 billion. Hawaii and other areas of the Pacific boast some of the most beautiful and exotic reefs on the planet, but they are threatened by a variety of impacts, from global

warming and vessel groundings, to invasives, pollution, and overharvesting. These impacts are even more apparent in the Western Pacific, where communities may rely almost exclusively on coral reefs and associated resources for economic survival.

We are particularly fortunate to have the Northwestern Hawaiian Islands as a laboratory for the study and protection of coral reefs. This remote and uninhabited area, 1,200 nautical miles long by 100 nautical miles wide, contains unparalleled resources for scientists and others concerned with coral ecosystem protection.

Congressional support for designation of this area as the largest National Marine Sanctuary in the world has given us the opportunity to map, monitor, assess, and explore these vast regions and habitats. The Sanctuary will help us build our base of knowledge to improve restoration and conservation of coral reefs around the world.

The Coral Reef Conservation Act of 2000, which Senator Snowe and I developed 5 years ago, helped us begin to identify our national coral reef resources, assess their condition and current threats, develop a national action strategy, and mobilize states, territories and the Federal Government to address the problem. Today, we see how far we have come, and how far we still need to go.

In our reauthorization of the Act, we must increase and focus funding on coral protection and conservation, and provide new authorities to prevent and respond to coral reef damage. We need to bring private and public resources together at the local level to ensure full community participation in protecting and conserving these sensitive areas. I look forward to working with my colleagues to pass this much needed reauthorization.

I am very pleased that we have assembled this group of experts today to discuss these very important issues. I look forward to your testimony.

The CHAIRMAN. Thank you, Senator. I have a list of our witnesses and I will go, for the sake of organization, from my left to right as we take your testimony. We'll have each witness summarize their remarks as they would desire and go through all of the testimony before opening it up to questions.

Our first witness is Joel Mandelman, Vice President and General Counsel of Nutech. I know that Senator Allen has presented some information already for the record, but we welcome you here and ask you to provide your testimony.

STATEMENT OF JOEL C. MANDELMAN, VICE PRESIDENT/ GENERAL COUNSEL, NUTECH O3, INC.

Mr. MANDELMAN. Thank you. First, we do want to thank Senator Inouye and Senator Stevens, for introducing the legislation. It's desperately needed, and we thank you for scheduling the hearing because this is, obviously, the first step in getting the bill passed. We hope this bill does pass, preferably with several amendments, which I'll discuss in a couple of minutes.

It's been our impression over the years that one reason Congress has been somewhat reluctant to move legislation of this type is the belief that there was no technology available that would solve the problem. The first thing I want to discuss with the Committee today is the fact that a solution is available, it would be here very shortly. So I'd like to spend a couple of minutes discussing how Nutech's ozone injection technology works so that the members of the Senate, and hopefully the House, will feel confident that a solution is available and that it meets the bill's requirements.

We've been working with British Petroleum for 8 years to develop ozone injection technology. What it involves is injecting ozone into the ship's ballast water as the ballast water is taken onboard the ship. The ozone kills invasive species in two ways. First, directly on contact; it will kill about half of the invasive species within 5 seconds of it being injected into the sea water. Then the ozone

begins to disintegrate, it reverts to oxygen so it's not creating a safety problem either on the ship or to the sea water.

Second, ozone interacts with bromide ions. Bromide ions naturally occur in sea water all over the world. The ozone oxidizes those ions and turns them into hypobromous acid. What the ozone did not kill, the hypobromous acid will kill. Then the hypobromous acid breaks down, probably breaking down faster in sunlight as it's spread over the surface of the water, but testing that we will be conducting later this year will develop definitive data that we can submit to the Committee on that point.

But the bottom line is, the treated ballast water will not harm the quality of the water into which it is discharged. Also, previous testing proved that ozone will not harm the hull of a ship, it does not increase the corrosion rate of a ship and, in fact, may in some instances decrease it because as the ozone kills bacteria that form in and around wells. It's the bacteria that secretes acid that cause a lot of corrosion. As those bacteria are destroyed the corrosion rate decreases. We've been working on this for really 5 years now. We have had one set of our equipment on a BP tanker that regularly transports Trans-Alaska Pipeline oil from Valdez to refineries in California and Washington. We will be putting a refined, and far less expensive, version of that technology on a second BP oil tanker in September. If the weather holds, we'll have at least some definitive final test results for Congress in December, and then everybody can feel absolutely confident that this has been proven under real world operating conditions on a real ship that carries 12 million or more gallons of ballast water. So if it works there, it will work anywhere.

That having been said, and we do support the bill, we would urge that the Committee adopt several amendments to it. The most important of these is an early start date. The bill as it now stands wouldn't require anybody to comply with it before 2009, and in some cases not till 2016. We feel this is extremely unwise. The pollution problem caused by invasive species is growing day by day. If technology is available, ours will be, we believe some of our competitors will have technology on the market, ships should be required to install it a great deal sooner. What we're recommending is 18 months after the Coast Guard certifies the first technology, that's when ships should be required to install it.

Third, we see absolutely no logical reason, and certainly not in terms of protecting the environment, to exclude from the statute ships that are already in service. As S. 363 and the IMO Treaty are now drafted, only new ships would be required to install ballast water treatment equipment. This is a serious mistake. All ships that have any reasonable useful life in them should be required to install the equipment.

Fourth, we suggest that the Coast Guard's STEP Program, which was an incentive to get people to install equipment prior to the start date or the implementation date, be expanded. As the program now stands only five or six ships a year at most could participate. We think every ship owner should be allowed to have 15, 20, maybe 25 ships in the program using either the same technology or different technologies because you want to encourage the ship

owners to do something they will not otherwise do until they are legislatively forced to do it.

Fifth, the method of determining compliance. The bill contemplates doing bacteria counts. We think, and from scientists we have talked to, there are some significant problems in getting representative samples, let's say out of 12 million gallons of ballast water, which is probably an amount of water several times larger than required to fill this room. If you're just taking four or five samples that is not scientifically representative of anything.

At a minimum, we urge that you adopt an additional testing standard. For example, total residual oxidants, that is finding in the treated ballast water a residual of the treatment chemical. With most of these chemicals, if there is any chemical left, that means you've killed all of the critters that you want to get rid of because if they were still alive they would have consumed the chemical.

This kind of testing can be done with automated equipment, it can be done with tamper-proof equipment that just relays the data to the Port Authority, to EPA, to the Coast Guard.

As an alternative to that, we would strongly suggest that once Coast Guard-certified equipment is installed on the ship, the captain of the ship signs a certification, under oath, under penalty of perjury, that the treatment equipment operated, that it was operating as certified for the amount of time that the manufacturer said was needed to treat the ballast water, and that certification should be sufficient. Then allow the Coast Guard, EPA, the Port Authority to conduct look-behind microbe counts on a periodic basis, once every 6 months, once every year.

The Committee needs to understand that doing microbe counts, aside from the problems I just discussed, is a time-consuming, very expensive operation. You can't do it onboard the ship, you must take water samples from the ship, transport them to a laboratory, and then do the count, and that must be done by hand. There's no computer technology that would enable somebody to do a microbe count. You literally sit there, counting critters on a little piece of microscopic-size graph paper. This can take weeks. Obviously, that is not a very effective means on a trip-by-trip basis of proving that a ship complied with the treatment requirements. You need an alternative.

The CHAIRMAN. Mr. Mandelman, I'm going to ask you to submit any further testimony for the record. We are working under a 5-minute clock and I would like to make sure as much time is available before the vote for all of the witnesses to provide testimony. I very much appreciate your remarks and understanding of the problem. I think the lights are self-explanatory and there are a full 5 minutes available and I won't shortchange anyone. You can rest assured.

[The prepared statement of Mr. Mandelman follows:]

PREPARED STATEMENT OF JOEL C. MANDELMAN, VICE PRESIDENT/GENERAL COUNSEL, NUTECH O3, INC.

I. The Need for Ballast Water Treatment Legislation

A. We commend Senator Stevens and Senator Inouye for taking the lead in sponsoring the Ballast Water Management Act and in moving the legislation closer to

passage. The invasive species problem requires a prompt solution. Invasive aquatic nuisance species threaten water quality, power plants, municipal water treatment systems, and ships throughout the United States. Prompt Congressional action is required to solve what is an acknowledged, and worsening, worldwide environmental and public health problem.

One of the major barriers to the development of treatment technologies has been the absence of definitive invasive species legislation and regulations. Without those clear guideposts, many prospective investors have been reluctant to commit venture capital to the small businesses that are the principal developers of the technological solutions for this problem. Ironically, passage of effective invasive species legislation has been delayed, in major part, by concerns that treatment technology was unavailable and that ship owners, therefore, could not meet the proposed law's ballast water treatment requirements.

That concern is no longer valid.

Nutech O3 has worked closely with British Petroleum, since 1998, to develop an effective means of killing dangerous aquatic nuisance species found in all ships' ballast water operating on the high seas; we anticipate having comparable data, and results, for vessels operating on the Great Lakes next Spring. Testing of our ozone injection technology began in 2000, with the installation of a prototype system on the 125,000 Dead Weight Ton (DWT) BP oil tanker, *T/V Tonsina.* This ship regularly transports Trans-Alaska pipeline oil from Valdez, Alaska, to refineries in Washington and California. Testing has continued, both onboard ship and by the University of Washington at its Merrowstone Test Facility.

All of the on-board ship and laboratory testing was conducted by an independent team of scientists and engineers from the University of North Carolina—Wilmington, the University of Washington, the University of Western Washington, the Department of the Interior—Fish and Wildlife Service, the Smithsonian Institution's Environmental Research Center in Edgewater, Maryland, ENSR, Inc. of Greeley, Colorado, Parametrix Inc. of Corvallis, Oregon, and Northeast Technical Services of Olmsted Falls, Ohio.

The Research Team's report was released in June 2002. Their report demonstrated that the injection of ozone into a ship's ballast water is an effective means of killing unwanted invasive species without damaging the quality of the receiving water into which the treated water is discharged. The report's primary conclusion was that ozone could serve as an effective biocide in the removal of invasive species from sea water, but (inferentially) that the technology required refinement before it would be commercially viable.

The Ballast Water Research Team's report also proved that ozone, when it is injected into sea water, forms various bromine compounds. This Total Residual Oxidant (TRO) typically decays over a 24 to 48 hour period after injection.

An earlier report, prepared by the La Que Institute for Corrosion Technology, of Wrightsville Beach, North Carolina, demonstrated that ozonated water will not increase the rate of corrosion of a ship's hull or impact the ship's sacrificial zinc anode. It should also be noted that the introduction of ozone and bromine compounds to the ballast water inhibits oxygen thriving colonies of bacteria that exist in weld areas. Those bacterial colonies are a major cause of corrosion.

B. Last year, Congress earmarked $1.7 million for the development of an advanced, more technologically efficient and affordable version of our technology. With the assistance of the National Oceanic and Atmospheric Administration, Nutech will install an advanced version of this ozone injection technology on a second BP oil tanker, the 140,000 DWT, *T/V Prince William Sound,* in September 2005. This improved version of this technology will cost approximately 65 percent less to build and install than the original version, the installation time will be sharply reduced and it may be possible to perform most (if not all) of the installation work without taking the ship out of service. All of this testing will be completed no later than the Spring of 2006 and, if favorable weather conditions exist, it may be completed before that time.

NOAA has established an Advisory Panel, to work with Nutech and the Ballast Water Research Team, to assist in the development of the Testing Protocol that will be used during the *Prince William Sound* test series. This Advisory Panel includes representatives from the U.S. Coast Guard, the U.S. Navy, the Fish & Wildlife Service, the Environmental Protection Agency, the California State Lands Commission, the Washington State Department of Fish & Wildlife, the Chamber of Shipping of America and British Maritime Technologies, a major ship design and engineering firm.

Nutech is confident that it has developed an effective and affordable solution to the invasive species problem. Therefore, we strongly urge that the Commerce Com-

mittee, and the Senate, promptly enact the Inouye-Stevens Ballast Water Management Act, with the changes that we recommend.

C. Nutech's Ballast Water Treatment System will pay for itself, in operational cost savings, within 12 to 18 months of its installation. Our cost savings estimate is based on data published by the Coast Guard, in its March 2003 ANPRM. *This data showed that a deep ocean ballast water exchange costs a ship owner between $16,000 and $80,000, per exchange. This is a shipping industry trade association estimate.* Since the typical tanker or freighter has a useful life exceeding 30 years and, typically, conducts at least one ballast water exchange a month, the savings will run into the millions of dollars over the ship's life.

II. Suggested Changes to the Ballast Water Management Act

Amendment #1—Speeding Up the Compliance Timetable

Premised on the availability of effective treatment technology, we, therefore, think that it would be reasonable to move up the implementation date from the distant schedule contained in the IMO Treaty and carried over into S. 363. Under our recommendation, all affected ship owners would have 18 months after the date on which the Coast Guard certifies the availability of an effective treatment technology to install it on their ships.

Since we believe that our technology, and those of some of our competitors, can be installed without taking the ship out of service or, at most taking it out of service for only a few days, the prompt installation of many treatment technologies will not impose a financial burden on ship owners while rapidly improving the quality of local water supplies.

Amendment #2—Encouraging the Installation of Ballast Water Treatment Technology Before the Bill's Initial 2009 Compliance Date

Invasive species pose an increasing threat to water quality. Therefore, Congress should take all available steps necessary to encourage ship owners to install ballast water treatment equipment at the earliest practicable date, prior to the bill's initial planned implementation date of 2009.

Therefore, the technology incentive provisions of the Ballast Water Management Act, carried over from the IMO Treaty, need to be significantly modified. The application process was too cumbersome and it is limited to only 5 or 6 ships a year. *As currently drafted, those provisions will discourage ship owners from participating in a program in which the maximum number of ships, and ship owners, should be encouraged to participate.*

We recommend that the Commerce Committee take the Coast Guard's STEP Program, issued in January 2004, and expand its more generous scope (more generous in comparison to the IMO Treaty's parallel provisions) to allow a far larger number of ships, operated by the same ship owner, to participate in the experimental technology program.

More importantly, in terms of encouraging ship owners to participate in the STEP Program, we recommend that anyone installing approved technology prior to the bill's mandatory implementation date be permanently grandfathered, *i.e.,* permanently deemed to be in compliance with statutory or regulatory treatment standards even if the standards become more stringent in later years. For both reasons, we believe that this proposal will offer ship owners the necessary economic incentives to install treatment technology well ahead of the bill's stretched out compliance deadlines.

Without this proposal, the invasive species problem will unnecessarily worsen before the shipping industry starts to use the technological solutions now available to it. With them, it will be far more likely that ship owners will take the lead in installing treatment technology before the contemplated compliance dates, instead of waiting until the last possible minute to do so. With it, technology vendors will be encouraged to bring new treatment technologies to the market more quickly. And investors, who have mostly remained on the sidelines, waiting for regulatory agencies, and the Congress, to establish the rules of the game, will be encouraged to bring venture capital to the market which, until now, they have been very reluctant to do.

Amendment #3—Additional Means of Verifying Compliance With Ballast Water Treatment Requirements

In terms of enforcing the bill's treatment requirements, it is essential that a ship captain's ability to prove to the Coast Guard that the ship has complied with those requirements be temporally and economically feasible. This is especially critical if proof of treatment must be presented each time a ship enters a port and discharges ballast water or has done so inside the Exclusive Economic Zone.

Conducting microbe counts is not a practical or economical means of proving that compliance, especially on a multiple trip, or multiple port entry basis. Such counts are very expensive. They require trained, scientific personnel. Expensive laboratory equipment is required. Moreover, it can take several days to transport ballast water samples from a ship to a laboratory. The microbe count could rapidly increase (or decrease) during shipping, thus providing inaccurate results to an enforcement agency. For all of these reasons, such counts cannot routinely be conducted onboard a ship.

Moreover, it is very doubtful that taking a few ballast water samples, even from widely dispersed areas of a ballast tank, is a statistically accurate method for proving that the ballast water has been treated to a specific microbe per-cubic-meter of water standard. A typical oil tanker carries 12 to 18 million gallons of ballast water in a ship that has ballast water compartments running the entire length, width and height of a ship that may be 900 or more feet long, 100 or more feet wide, and 100 or more feet high. It is highly improbable that a few gallons of water taken randomly from those ballast tanks will be representative of the content of the ship's ballast water. This is especially so since it is practically impossible to take samples from tanks immediately above the bottom of the ship's hull.

While it may be desirable to perform such sampling annually, or on some other periodic basis, to establish another reference point for gauging the effectiveness of a treatment system, it is not practical to do so during every port entry. Our testing has proven that the presence of a Total Residual Oxidant (TRO) is an effective and scientifically accepted methodology for proving that ballast water has been properly treated. This identical methodology has been in use, for decades, to prove that drinking water has been properly chlorinated (or, these days, ozonated) pursuant to the Safe Drinking Water Act's Surface Water Treatment Regulations.

It has also been suggested that after the Coast Guard certified that a given technology meets the established treatment standard, that the ship's captain certifying that the approves equipment was in operation for the required time period be accepted as proof of compliance.

Testing for the required level of a TRO is easily performed. Nutech, for example, can provide customers with off-the-shelf, automated, equipment that will measure TRO levels as the system is in use. This is less difficult, and less time consuming, than testing a swimming pool's water for the proper level of chlorine. Use of this testing procedure is not limited to ozone injection treatment technology. This technique should work as well with other biocides producing bio-chemical residuals. *Thus, requiring that the Coast Guard (and EPA) accept TRO levels as proof of compliance would not give Nutech a competitive advantage over other biocide-based technologies.*

In any event, nothing in draft amendment #3 would preclude the Coast Guard (or EPA) from conducting microbe counts on an annual basis as a back up means of certifying or recertifying the effectiveness of any given ballast water treatment technology, assuming that accurate sampling methodology can be established. Finally, this amendment requires that state regulatory agencies also accept, as conclusive, whatever test data are acceptable to the Coast Guard as proof of compliance with parallel state regulations.

Amendment #4—Ballast Water Management Act Should Be the Exclusive Legislative Authority for Regulating Ballast Water Discharges

We understand the Chamber of Shipping of America has urged the adoption of an amendment that would make it explicitly clear that the Ballast Water Management Act provides the sole legislative authority for mandating the treatment, and regulating the discharge, of ballast water. This proposal would prevent conflicting regulation of such discharges under the Clean Water Act. We strongly support adoption of that proposal.

We also support the Chamber's proposal that Congress preempt this area of environmental regulation and bar the enforcement of any conflicting, or more stringent, State ballast water treatment regulations such as those enacted by Michigan and California.

Amendment #1—S. 363

Delete the Implementation Schedule, page 21 line 3 through page 22, line 4 and insert, in lieu thereof, the following:

(3) Implementation Schedule—Paragraph (1) applies to vessels in accordance with the following schedule and procedures.

(D) Effective Date—The effective date of this Act shall be January 1, 2007.

(E) Vessels Required to Treat Ballast Water—All covered vessels in operation on, or after, the effective date of this Act shall be required to install ballast water treatment equipment no later than 18 months after the Coast Guard certifies that at least one technology or process meets the treatment standards set forth contained in section (f).

(F) Excluded Vessels—The following vessels shall not be required to install ballast water treatment equipment:

(i) Any vessel that initially entered service 25 years, or more, prior to the effective date of this Act.

(ii) Any vessel of less than 1,000 Gross Registered Tons.

(iii) Any vessel that, in the ordinary course of its operations, does not carry ballast water.

(iv) Combat vessels of the Navy and the Coast Guard unless they are required to treat ballast water pursuant to regulations subsequently adopted by the Navy or the Coast Guard. Vessels that primarily carry cargo for military use shall be required to treat their ballast water in accordance with section (f).

(v) Comparable vessels of foreign Navies.

Amendment #2—S. 363

Strike from Page 23, line 3 though page 24, line 7 all of the section entitled "Delay of Application for Vessel Participating in Promising Technology Evaluations," and insert, in lieu thereof, the following:

(5) Experimental Testing and Approval of Ballast Water Treatment Equipment—Permanent Use Testing and Certification of treatment Equipment.

(A) In General—The Coast Guard shall continue in effect the Shipboard Evaluation & Testing Program (STEP Program) established in the Coast Guard's Navigation and Vehicle Inspection Circular, NVIC 01–04, of January 2004, subject only to the revisions set forth in subsection (B). The STEP Program shall not be discontinued or otherwise modified, except as provided herein, without the express authorization of the Congress.

(B) Modifications to NVIC 01–04—The Coast Guard's NVIC 01–04 is modified, as follows:

(1) Any ship entering the Exclusive Economic Zone of the United States including the waters of Alaska, and also including the Great Lakes, the Hudson River, the Mississippi River or any tributary thereof, shall be eligible to participate in this program irrespective of the country in which it is registered or in which its owner is incorporated or organized.

(2) Each vessel owner or operator wishing to participate in the STEP Program shall file with the Coast Guard a single application for each technology it wishes to use. That application shall apply to as many as fifteen (15) ships of the same or similar design, irrespective of the ship's ballast water capacity provided the vessel regularly operates carrying not less than 500,000 gallons of ballast water.

(3) A ship owner or operator may have in the STEP Program no more than twenty-five (25) vessels of all designs and sizes, using differing technologies, at any one time.

(C) Authorization—There is authorized $100,000,000 for Fiscal Years 2006 and 2007, to pay for the establishment and operation of such test facilities, and the hiring of personnel, as the Coast Guard determines may be required to fully operate the STEP Program.

(D) Use of Independent Testing Laboratories Required—The Coast Guard is directed to employ independent, non-governmental laboratories and personnel for the purpose of evaluating and certifying ballast water treatment technologies and equipment at least until such time as the Coast Guard has established, equipped, and staffed a sufficient number of government operated test facilities so that any technology or equipment vendor submitting equipment for testing and certification has that process completed within sixty (60) calendar days of its submission to the Coast Guard.

(E) Standing to Sue—Any equipment vendor whose equipment or technology is rejected for use in the STEP Program, or which the Coast Guard or the Environmental Protection Agency, refuses to certify, or decertifies, for permanent use onboard a vessel, shall have standing to file suit, pursuant to the provisions

of the Administrative Procedures Act, for injunctive relief or such other relief as is authorized by Federal law. Such suit may be filed in the district court in which the aggrieved party maintains its principal place of business or in the United States District Court for the District of Columbia.

(F) Applicability—The foregoing provisions supersede any conflicting provisions of NVIC 01–04, or any subsequent modifications thereto, and supersede any regulations heretofore issued by the Coast Guard, or by any other agency of the United States, pertaining to the testing of any type of ballast water treatment equipment or process in any pilot or experimental testing program or for permanent installation on any vessel subject to this Act.

Amendment #3—S. 363

On page 20, after line 13 insert a new subsection (2) and renumber the existing subsections accordingly:

(2) Verification of Compliance Methodologies—

(a) The Coast Guard shall conduct, not more than once in any 12 month period, an actual microbe count after the operation of a vessel's ballast water treatment technology, during the vessel's regular operation, to determine if the ballast water treatment equipment is treating the ballast water to the standard set forth in section (1).

(b) For purposes of determining compliance at all other times during a vessel's actual operation the Coast Guard, the Environmental Protection Agency, and all state regulatory agencies, shall accept as conclusive proof of the required treatment of the vessel's ballast water:

(i) An actual microbe count demonstrating compliance with the standards set forth in section (1) that is conducted in accordance with generally accepted scientific testing methodologies; or,

(ii) The presence of Total Residual Oxidant (TRO), or other residual chemical in the treated ballast water, at a level consistent with the killing of the organisms required to be removed from that ballast water, that is conducted in accordance with generally accepted scientific testing methodologies;

(iii) Any other verification standard or methodology that is scientifically acceptable to the Coast Guard that is conducted in accordance with generally accepted scientific testing methodologies; or,

(iv) In lieu of any of the foregoing, the Coast Guard, the Environmental Protection Agency and any State regulatory agency may accept as proof of operational compliance with the treatment requirements of section (1) that: (I) the treatment equipment was certified by the Coast Guard as meeting the treatment standards of section (1); and (II) that the vessel's captain affidavit and supporting written documentation showing that the vessel's ballast water treatment system was in operation for the period of time required pursuant to its certification by the Coast Guard, to treat the ballast water to the standards required by section (1).

Senator SUNUNU. Our next witness is Kathy Metcalf, Director of Maritime Affairs for the Chamber of Shipping of America. Welcome.

STATEMENT OF KATHY J. METCALF, DIRECTOR, MARITIME AFFAIRS, CHAMBER OF SHIPPING OF AMERICA; ON BEHALF OF THE SHIPPING INDUSTRY BALLAST WATER COALITION

Ms. METCALF. Thank you, Mr. Chairman, Senator Boxer, Senator Inouye. I'm here today on behalf of the Shipping Industry Ballast Water Coalition. And we are pleased to be able to testify in support, with a few exceptions, of Senator Inouye's Senate Bill 363, and finally downloaded just last night off the GPO website, Senator Boxer, your S. 1224 bill, while we have not had a chance to go through the entire bill, but certainly we've looked at the ballast water section.

Our coalition is an informal organization of maritime trade associations and companies that own, operate, and charter all types of vessels engaged in domestic and international trade and represent, essentially, over 90 percent of large commercial vessels that are trading in U.S. waters. And by virtue of the membership of the American Association of Port Authorities, the Coalition also represents the ports to which these vessels trade.

Due to the time limitations I will make one comment that while the testimony we provide today highlights the agreement by a vast majority of our coalition, our members would respectfully request the opportunity to provide written comments to the record for additional information or points they may wish to make.

General comments. We congratulate Senator Inouye and Senator Boxer for taking the lead on this issue in a way that the Coalition is very supportive of. Senators, your two bills are the only bills that we have seen thus far, and I've been working on this issue for over 8 years, which most closely resemble the recently agreed to IMO Convention. The Coalition always has and will continue to support prompt enactment—let's don't slow the process down—but prompt enactment of a national ballast water management program that reflects, to the maximum extent possible, the substantive provisions of this international agreement. While we note that, Senator Inouye, your bill and, Senator Boxer, yours as well, reflects a number of these similarities, there are five issues that we would like to point out that the industry has some concern with.

First, the Coalition would support altering the performance standard as currently contained in the bills to reflect the IMO standard. In the current proposals your performance standards, Senator, are a hundred times more stringent than what the international community has agreed is reasonably achievable in the near and medium term. And, in fact, with no disrespect of Mr. Mandelman because the ships that he is speaking about are also operated by our members, we still have not yet seen any peer-reviewed scientific data that suggests we can even reach the IMO standard. So we respectfully request your consideration of that change, noting that in the pre-review process, the ability to change the standard to reflect the realistic capabilities of technology at a given point in time will exist.

We also support the inclusion in your bill of a quantitative performance standard and not leaving this issue in the development through a regulatory process. I can unequivocally state to you that it was only when the fixed quantitative standard was established by IMO that ship owners and technology developers finally began to be able to justifiably commit financial and human resources to solving this problem. For now we had a hard target at which to aim, so it is critical that your bill contains the quantitative standard. Now, other bills include standards that would be based on best available technology, and while conceptually we have no problem with best available technology, we do not believe it has a place in establishing the initial standard. It will, appropriately by default, become the general criteria for later adjustments of the standard to reflect developing technology.

Very quickly, both of your bills contain provisions for a pre-review process and a feasibility analysis. We would suggest that the

provisions as drafted are fine, but we would also suggest the addition of five specific criteria that are currently listed in the IMO Convention to provide better direction to the regulatory agencies which will conduct these reviews. These five criteria are considerations of safety, environmental acceptability, practicability, cost-effectiveness, and biological effectiveness.

The next issue is relative to preemption. We believe strong Federal preemption is necessary in an enacted legislation. Senator Inouye, your bill does contain a preemption clause, but it's one that we think could be made stronger by a little bit stronger language, and in my review late last night of S. 1224, regrettably, we did not see that preemption clause so we would recommend that clause be included in your bill, Senator Boxer. We also believe that due to a recent District Court decision for the Northern District of California relative to the control of ballast water through the Clean Water Act NPDES Program, which we disagree with, but nonetheless, it is still a court decision, so that we would strongly recommend the inclusion of language in your bill that establishes your bill as the exclusive Federal law governing ballast water exchange. In other words, your bill would create the permitting system for ballast water rather than trying to shove a square peg into a round hole. We all can remember with great concern when EPA tried to accommodate the storm water discharges into their system and how long that took. Too long, we cannot afford to wait that long.

And, finally, wrapping up, we believe there's a need, a vast majority of the Coalition believes there's a need for a specific exemption for tug barge operations. Briefly, to describe this in 15 seconds, as currently drafted without an exemption, without a safety exemption for these operations, we will be asking human beings to disconnect a tug and a barge in the middle of the ocean, and even on a calm day we're talking five- to seven-foot seas, and move a human being 20 to 30 feet up a steel vertical wall so they can climb on that barge to do ballast water exchange. Please note the exemption is only relative to exchange and not to treatment. Please also note that this exemption is not without precedent because the States of Oregon and Washington already contain such an exemption in their state law.

We thank you for the opportunity to testify. We would be pleased to answer any questions you may have.

[The prepared statement of Ms. Metcalf follows:]

PREPARED STATEMENT OF KATHY J. METCALF, DIRECTOR, MARITIME AFFAIRS, CHAMBER OF SHIPPING OF AMERICA; ON BEHALF OF THE SHIPPING INDUSTRY BALLAST WATER COALITION

Mr. Chairman, we appreciate the opportunity to testify before you today on the subject of invasive species management, and specifically, the provisions of Senate Bill 363, the Ballast Water Management Act of 2005 as introduced by Senator Inouye on behalf of himself and Senators Akaka, Cantwell, Lautenberg, Sarbanes and Stevens.

The Shipping Industry Ballast Water Coalition (the Coalition) is an informal organization of maritime trade associations and companies that own, operate, or charter commercial vessels of all types engaged in both domestic and international trade, and represents over 90 percent of the vessels calling in U.S. ports. The types of vessels owned and operated by Coalition members include oceangoing and coastwise containerships, tankers, roll-on/roll-off vessels, bulk carriers, and passenger vessels as well as tug/barge units which operate in oceangoing, coastwise, and inland waters. While the testimony we provide today highlights points of agreement by the

vast majority of the Coalition, individual members of the Coalition would respectfully reserve their right to provide written comments to this record to provide additional information as they deem necessary.

The Coalition was formed over 4 years ago by a number of entities that believed resolution of this complex issue required the coordinated efforts of all stakeholders. Since that time, the Coalition has provided testimony or comments to both legislative and regulatory initiatives regarding ballast water management both at the international and domestic level.

General Comments

The Coalition congratulates Senator Inouye and his colleagues for drafting the proposed legislation as it is, to date, the legislation which most closely mirrors the management structure as contained in the recently agreed upon International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004 (the IMO Convention) by the member states of the International Maritime Organization. The Coalition has always and continues to support the prompt enactment of domestic legislation which will establish a national ballast water management program and that reflects, to the maximum extent possible, the substantive provisions and regulatory framework of the IMO Convention. In this regard, the Coalition supports the provisions of S. 363 with a few specific changes as noted below.

The Ballast Water Management Performance Standard

The Coalition supports changing the performance standard as currently included in S. 363 to reflect the standard contained in the IMO Convention. As currently drafted, S. 363 contains a performance standard that is one hundred times more stringent than that contained in the IMO Convention. It is important to note that at this point in time, there is no published peer-reviewed data that suggests the existence of technology which can achieve the IMO standard, although we are hopeful that this technology will emerge from testing programs which are underway around the world and on a variety of ships. It is this data, once published and peer-reviewed, that will become part of the pre-review process conducted at IMO, and under the pre-review process as contained in S. 363 as introduced. What is critical here is that the first standard be achievable, recognizing future adjustment of the standard during the periodic review process which will reflect the capabilities of emerging technology to provide even more efficient treatment results.

The Coalition also strongly supports including a quantitative performance standard in the legislation itself and not leaving the establishment of the performance standard to the regulatory process. For a number of years, members of our Coalition have had discussions with technology developers and reviewed various ballast water treatment technologies. I can unequivocally state that it was only when the fixed quantitative standard was established by IMO, that shipowners and technology developers alike were in a position to commit vast sums of financial and human resources to finding a solution to this perplexing problem. Once this quantitative standard was established, shipowners and technology developers alike had a "hard target" at which to aim. While the concept of "best available technology" is a viable one, it has no place in establishing initial performance standards for ballast water treatment systems. It will more appropriately, by default, become the general criteria for later adjustments of the standard to reflect developing technology.

Review of Standards and Feasibility Review

Section 3(f) of S. 363, entitled Ballast Water Treatment Requirements, contains provisions for a periodic review of standards (3(f)(4)) and an initial feasibility review (3(f)(6)). These are key provisions in ensuring that appropriate technologies are available to achieve the initial standard and provide for periodic reviews of the established standard in light of new technologies that provide even more effective treatment results. While the Coalition strongly supports inclusion of both of these provisions, we believe that more detail is necessary in the legislation to guide the regulatory program which will implement these provisions. Specifically, the Coalition believes that the legislation should explicitly include five specific criteria on which these reviews will be based. The five criteria are considerations of safety, environmental acceptability, practicability, cost effectiveness, and biological effectiveness. By including these specific criteria, Congress will more clearly outline the charge to the agencies which will be responsible for implementing these review programs.

Urgent Need for a Coordinated Federal Program Which May Be Implemented by the States

Shipping is international and the regulation of shipping should be, too. While this is not always possible, the Coalition believes that regulation of shipping through

international requirements, as established by IMO, is the correct way to comprehensively regulate the industry in a clear manner. However, there are cases where domestic legislation has been enacted which varies with international requirements. Not without some pain, the industry has adjusted to these U.S. requirements. However, in the case of ballast water management, the industry has, over the past several years, been exposed to state requirements that, in some cases, have varied from the Federal requirements. We fear this trend will continue without the inclusion of appropriate language in S. 363. Continuing this patchwork-quilt approach would be catastrophic for the environment and the industry, and undermine the progress that we can make on this issue by the establishment of a strong, uniform Federal program. Therefore, the Coalition strongly advocates the modification of the current preemption language found at Section 3(q) to reflect the recognition that the program, as established under this legislation is the sole program established in the United States for the management and control of ballast water discharges. With the implementation of this strong Federal program, there should be no need for state, regional or local implementation of additional or conflicting ballast water management requirements, and thus, the inclusion of strong preemption language is appropriate.

S. 363 as the Exclusive Federal Program Which Regulates Ballast Water Management and Discharges in U.S. Waters

The Coalition strongly believes that enacted ballast water legislation should be the exclusive Federal program which regulates ballast water management and discharges in U.S. waters. As a result of a recent U.S. district court decision, there is some question as to whether Congress intended to include ballast water discharges under provisions of the Clean Water Act, and specifically the National Pollutant Discharge Elimination System permitting program. The Coalition strongly supports Congressional action to clear up this confusion and recommends the inclusion of appropriate text to clearly manifest Congress's intent to regulate ballast water management under the provisions of ballast water-specific legislation such as S. 363.

Need for a Specific Exemption From Ballast Water Exchange Requirements for Tug/Barge Operations

A vast majority of the Coalition believes that an express provision should be included in S. 363 which exempts tug and barge operations from the ballast water exchange requirements. The basis for this specific exemption relates to the inherently unsafe nature of maneuvering a tug alongside a barge and then place a human life at risk by requiring a crew member to scale what is essentially a 20 to 30 foot vertical steel wall, in order to allow exchange to be conducted on the barge at sea. While the existing safety exemption would arguably cover such an operation, it would be more appropriate to clearly manifest the intent of Congress that such an operation would not be condoned by including specific language exempting tug/barge operations from the ballast water exchange requirements. In fact, Washington and Oregon have exempted tug and barge operations from state requirements to conduct ballast water exchange. These states have acknowledged the inherent risks in requiring barges to conduct ballast water exchange. It is important to note that this exemption would not apply to the integration of ballast water treatment systems as they become available, provided that the system would enable treatment of ballast while the vessel was berthed, and thus, obviate the need to conduct an unsafe operation at sea.

We appreciate the opportunity to provide testimony to your subcommittee and would be pleased to answer any questions you may have.

The CHAIRMAN. Thank you, Ms. Metcalf. Our next witness is Rear Admiral Thomas Gilmour, Assistant Commandant for Marine Safety and Environmental Protection at the Coast Guard. Welcome, Admiral.

STATEMENT OF REAR ADMIRAL THOMAS H. GILMOUR, ASSISTANT COMMANDANT FOR MARINE SAFETY, SECURITY AND ENVIRONMENTAL PROTECTION, U.S. COAST GUARD

Admiral GILMOUR. Good morning, Mr. Chairman and distinguished members of the Subcommittee. It's certainly my pleasure to appear before you today to provide our views on ballast water

management and Ballast Water Management Act of 2005, S. 363, and I'll also touch briefly on coral reef protection.

The Administration certainly shares this committee's concern with the significant environmental and economic damage that has been caused by aquatic invasive species and recognizes that ballast water discharge is one of the important pathways for such invasions. We are committed to working with Congress to enact effective legislation that will address ballast water, the ballast water issue, and substantially reduce the threat of damaging invasions through this pathway. In early 2001, through a series of international workshops, the Coast Guard began working with scientists, marine engineers, experts from water treatment industry, and our Federal agency partners to develop criteria for a ballast water discharge standard. These workshops concluded that this standard should address all organisms at all life stages and it be concentration-based, set at values that are scientifically sound, environmentally protective, and enforceable. We are currently completing an environmental impact statement analyzing the impacts of several alternative standards as well as a cost benefit analysis associated with this rulemaking.

In February of 2004, the Coast Guard led an inter-agency United States delegation to the International Maritime Organization's diplomatic conference on ballast water management of ships. The conference adopted the International Convention for the control and Management of Ships' Ballast Water and Sediments, 2004, which is a significant step forward in the international effort to combat invasive species introduced through ships' ballast. One significant provision of the convention calls for ships to meet a ballast water discharge standard according to a schedule of fixed dates beginning with certain ships constructed in 2009. These fixed dates serve as a signal to the shipping industry, as well as to emerging ballast water treatment industry of the need for the investment, plans, and inventory to meet Ballast Water Management requirements. Another key feature of the implementation schedule is the phasing out of the practice of ballast water exchange, which means most ballast water discharges will eventually have to meet a maximum concentration standard. The ballast water discharge standard in the Convention would allow less than 10 organisms of a given size range, per-cubic-meter of discharge ballast water. The Coast Guard believes that this level of stringency may not be sufficient to adequately reduce invasions and that technologies currently under development may be able to do better.

However, substantial uncertainty remains in both of these areas. Significantly, the standard adopted by IMO is concentration-based, and we think that's important. This is desired by the United States because the concentration approach provides for more effective monitoring of compliance in a more uniform and protective level of risk reduction across all vessels.

The Ballast Water Management Act of 2005 contains many provisions similar to the IMO Convention adopted in 2004. The legislation provides for the eventual sunset of practice of ballast water exchange in favor of an environmentally protective ballast water treatment standard. The ballast water discharge standard in S. 363 is the same format of the concentration-based standard found in

the IMO Convention which deals with all organisms and their life states. The Ballast Water Management Act of 2005 also addresses the movement of non-indigenous species by ballast water between ports within the United States which is a critical step in controlling the spread of invasive species.

The continued ability to evaluate and the performance of prototype technologies under the Ballast Water Management Act of 2005, is also important. The Coast Guard has launched the Shipboard Technology Evaluation Program in 2004 as an incentive to assist vessel owners in the installation of prototype ballast water treatment systems under our current regulations.

In addition, we've been working closely with the Environmental Protection Agency's Environmental Technology Verification Program toward the development of a rigorous technical protocol for land based testing systems and the evaluation of ballast water treatment technologies.

The Coast Guard also works closely with the National Oceanographic and Atmospheric Administration to help preserve and protect coral reefs. In 2004, the Coast Guard dedicated over 2,000 aircraft and over 1,700 hours at a cost of over $13 million in coral reef enforcement efforts.

Thank you for the opportunity to provide these comments on the Ballast Water Management Act, and we look forward to working with Congress as we continue our ongoing efforts to implement an effective ballast water management regime. Thank you.

[The prepared statement of Admiral Gilmour follows:]

PREPARED STATEMENT OF REAR ADMIRAL THOMAS H. GILMOUR, ASSISTANT COMMANDANT FOR MARINE SAFETY, SECURITY, AND ENVIRONMENTAL PROTECTION, U.S. COAST GUARD

Good Morning, Mr. Chairman and distinguished members of the Subcommittee. I am Rear Admiral Thomas Gilmour, Assistant Commandant for Marine Safety, Security and Environmental Protection. It is my pleasure to appear before you today to provide the Coast Guard's views on ballast water management and the Ballast Water Management Act of 2005, S. 363, and to touch briefly upon coral reef protection.

The Administration shares this committee's concern with the significant environmental and economic damage that has been caused by aquatic invasive species and recognizes that ballast water discharge is one of the important pathways for such invasions. Over the past several years, the U.S. has been a leader in international efforts to address this problem. While we have made significant progress domestically under the current legislative framework, there is no question that this framework needs to be upgraded to move us to a higher level of protection. We are committed to working with the Congress to enact effective legislation that will address the ballast water issue and substantially reduce the threat of damaging invasions through this pathway.

The Coast Guard is a leader in ensuring America's maritime environment is protected. We take great pride in providing valuable services that preserve and protect our Nation's waters, making them cleaner, safer, and more secure for legitimate use. The Coast Guard remains committed to providing a leadership role on ballast water management both domestically and internationally, and working diligently with all stakeholders to protect U.S. waters from the introduction of aquatic nuisance species.

In early 2001, through a series of international workshops, the Coast Guard began working with scientists, marine engineers, experts from the water treatment industry, and our Federal agency partners to develop the criteria for a ballast water discharge standard. These workshops concluded that the standard should address all organisms at all life stages, that it be concentration-based and set at values that are scientifically sound, environmentally protective, and enforceable. These criteria informed our approach for international negotiations at IMO as well as to our rule-

making to develop a ballast water discharge standard, currently in process. The ballast water discharge standard will be used to approve ballast water management equipment installed on ships as an alternative to ballast water exchange, under our current authority. The standard will also be used to evaluate compliance on vessels performing treatment. We are currently completing a Programmatic Environmental Impact Statement analyzing the environmental impacts of several alternative standards as well as the cost-benefit analysis associated with this rulemaking.

In February of 2004, the Coast Guard led the interagency United States delegation to the International Maritime Organization's (IMO) Diplomatic Conference on Ballast Water Management for Ships. The Conference adopted the International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004, which is a significant step forward in the international effort to combat invasive species introduced by ships' ballast water. The U.S. delegation played a major role in development of the Convention's basic structure and in ensuring that a number of key objectives were included in this new treaty.

One significant provision of the Convention calls for ships to meet a ballast water discharge standard according to a schedule of fixed dates, beginning with certain ships constructed in 2009. These fixed dates serve as a signal to the shipping industry as well as to the emerging ballast water treatment industry of the need for investment, plans, and inventory to meet ballast water management requirements. Another key feature of the implementation schedule is the phasing-out of the practice of ballast water exchange, which means most ballast water discharges will eventually have to meet a maximum concentration standard. The Convention contains provisions for the experimental testing of prototype ballast water treatment systems on operating vessels. In addition, the Convention contains a U.S. backed provision that allows the sampling of ballast water from ships as a port state control activity for the purposes of evaluating compliance with the Convention.

While there were many important and positive provisions adopted by the Conference, one significant element is the stringency of the ballast water discharge standard. For example, the standard in the Convention would allow less than 10 organisms of a given size range per-cubic-meter of discharged ballast water. The Coast Guard believes that the Convention's level of stringency may not be sufficient to adequately reduce invasions, and that technologies currently under development may be able to do better. However substantial uncertainty remains in both of these areas. Significantly, the standard adopted by IMO is *concentration-based* rather than expressed as a percent removal. This was desired by the U.S. because the concentration approach provides for more effective monitoring of compliance and a more uniform and protective level of risk reduction across all vessels. Further, the standard, as adopted, when met by all vessels, will likely significantly reduce the discharges of potentially invasive species via ballast water. Since the adoption of the Convention, the Coast Guard has led an interagency delegation in the development of supporting guidelines for the implementation of the Convention, the first set of which will likely be adopted by IMO resolution in July.

The Ballast Water Management Act of 2005, contains many provisions similar to the IMO Convention adopted in 2004, and is consistent with the basic structure of the Convention. In addition to authorizing an amendment to the Non-indigenous Aquatic Nuisance Prevention and Control Act/National Invasive Species Act, the legislation provides for the eventual sunset of the practice of ballast water exchange, in favor of an environmentally protective ballast water treatment standard. The ballast water discharge standard in S. 363 is the same format of a concentration-based standard found in the IMO Convention, which deals with all organisms and their life states. This concentration-based standard is important in that it provides a threshold for the maximum number of organisms in a volume of discharged ballast water regardless of the source of the ballast water or type of vessel. This is essential for both the approval of ballast water treatment systems and enforcement of the discharge standard on ships. However, the standards in S. 363 are 100 times more stringent than the standards found in the IMO Convention. There has been no evaluation to date of currently-available technologies to show whether extant and prototype ballast water treatment systems would be able to achieve the standards set in the bill. The Administration believes it may be premature to fix these standards in legislation, given the substantial uncertainties in the future capabilities of emerging technologies.

The Ballast Water Management Act of 2005, also addresses the movement of non-indigenous species by ballast water between ports within the U.S., which is a critical step in controlling the spread of invasive species. To date, there has been no significant analysis of the risks presented by these ballast water discharges against the feasibility of various ballast water management options.

The continued ability to evaluate the performance of prototype technologies under the Ballast Water Management Act of 2005, is also important, as the Coast Guard launched the Shipboard Technology Evaluation Program in 2004, as an incentive to assist vessel owners in the installation of prototype ballast water treatment systems under our current regulations. In addition, we have been working closely with the U.S. Environmental Protection Agency's Environmental Technology Verification Program in the development of rigorous technical protocols for land-based testing and evaluation of ballast water treatment technologies. This provision will allow the Coast Guard to continue facilitating the development of improved ballast water treatment technology, even after the application of a ballast water discharge standard to all vessels.

The Coast Guard also works closely with the National Oceanic and Atmospheric Administration (NOAA) to help preserve and protect coral reefs. In 2004, the Coast Guard dedicated 2,032 aircraft, 323 boat, and 1,708 cutter hours at a cost of over $13 million, in such enforcement efforts. The Coast Guard has also worked with NOAA, the State of Hawaii, the Department of the Interior, and local organizations to help remove marine debris from coral reefs surrounding the Northwestern Hawaiian Islands.

Thank you for the opportunity to provide comments on the Ballast Water Management Act of 2005. The Coast Guard looks forward to working with Congress as we continue our ongoing efforts to implement an effective ballast water management regime. I will be happy to answer any questions you may have.

The CHAIRMAN. Thank you, Admiral. Tim Keeney is the Deputy Assistant Secretary of Commerce for Oceans and Atmosphere.

STATEMENT OF TIMOTHY R.E. KEENEY, DEPUTY ASSISTANT SECRETARY OF COMMERCE FOR OCEANS AND ATMOSPHERE, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, U.S. DEPARTMENT OF COMMERCE

Mr. KEENEY. Good morning, Mr. Chairman, and members of the Subcommittee. I also co-chair both the Aquatic Nuisance Species Task Force and the Coral Reef Task Force. I'm pleased to be here today to discuss both of these important issues. The U.S. Ocean Action Plan outlines the importance of each of these topics with specific goals of promoting coral reef conservation as well as preventing the spread of invasive species. Today I'll discuss both our coral and ballast water programs.

The Coral Reef Conservation Act of 2000 called for the creation of a national strategy and program to address the threats to coral reef communities. This led to the creation of NOAA's Coral Reef Conservation Program or the CRCP, which draws experts together from across NOAA and engages external parties to develop integrated strategies to address coral reef decline on the local, national, and international scales. The authority provided to NOAA under the Act has yielded many benefits to coral reef management and protection. Reauthorization of the Act is an important step in continuing this work. Reauthorization will allow continuation of important NOAA-sponsored mapping, monitoring, research management efforts throughout the CRCP national and grants programs and the Coral Reef Conservation Fund partnered with the National Fish and Wildlife Foundation.

In addition to carrying out the requirements of the Act, NOAA continues to play an important and active role in the U.S. Coral Reef Task Force which brings together Federal and non-Federal members to exchange information and collaboration on new actions. Many of NOAA's coral reef conservation efforts have been developed in partnership with task force members. While the Act has allowed NOAA to develop an effective coral program, there are

some limitations to the current act that if addressed could significantly advance efforts to conserve our valuable coral reef resources. For example, although the Federal Government has authority to address coral reef damage from groundings in designated protected areas such as national marine sanctuaries, no similar authority exists to respond to any groundings that occur outside of these areas. Appropriate authority in the act would enable NOAA to respond to events and recover from the responsible party the cost for both the response and where warranted, comprehensive damage assessment in restoration activities. The Administration and Congress have recognized the value of this program. It would be appropriate to recognize the support by authorizing the Act at the President's Fiscal Year 2006 request level of $27.2 million and ensure that an adequate portion of this funding is available for effective program administration.

I'd now like to address the critical issue of invasive species in ballast water. Non-indigenous species are affecting habitats and species in all of our lakes and streams. Introduction of new species can alter both the physical habitat as well as impact native species in ecosystem productivity. For example, last year Ohio shut down its Great Lakes smallmouth bass fishery for two of the most popular months for this recreational fishery. The closure surprised the public because the cause was a fish much smaller than the smallmouth bass—the round goby, a ballast water introduction that eats bass eggs. Because NOAA is a trustee for living marine resources we are particularly concerned with introductions of non-indigenous aquatic species that may affect Federally-managed fisheries. In the Summer of 2000, there was a massive jellyfish bloom in the coastal areas of Alabama and Mississippi. Because of clogged nets, shrimping operations had to be suspended and it has been estimated it cost shrimpers over $10 million.

I would like to update the Subcommittee on our progress in addressing ballast water issues. NOAA and Fish and Wildlife Service are charged with sponsoring research to develop new technologies for ballast water management. Since 1998, 54 research projects have been sponsored under the Ballast Water Demonstration Program and 16 additional ballast water-related projects have been sponsored through the National Sea Grant Program. We have tested filtration, ultraviolet radiation, ozone injection, sonic bombardment, heat treatment, and oxidizing and non-oxidizing biocides. We are well beyond proof of concept with many of these technologies and there are some promising results.

As you know, the Coast Guard had made a formal finding and the voluntary guidelines included in the 1996 Invasive Species Act were not effective and issued regulations requiring ballast water management for vessels entering U.S. ports beyond the EEZ. All stakeholders recognize that exchange is an interim solution until methods for treating ballast water are developed.

NOAA supports the goal of S. 363 which is to reduce the risk of introducing new invasive species by ballast water. The 2006 President's budget request requests $7.9 million to continue NOAA's valuable work to prevent invasive species through programs such as the Aquatic Invasive Species Program, Sea Grant, the Great Lakes Environmental Research Laboratory, and the National Center for

Coastal Ocean Science. Considerable progress has been made in addressing the ballast water program since the 1996 reauthorization, but much work remains. With a strong commitment, I think that we'll be able to significantly reduce the risks associated with ballast water as a vector for the introduction of new species.

NOAA looks forward to working with the Subcommittee in ballast water legislation and the reauthorization of the Coral Reef Conservation Act. Thank you for inviting me here today. I'd be happy to respond to any questions the Subcommittee may have.

[The prepared statement of Mr. Keeney follows:]

PREPARED STATEMENT OF TIMOTHY R.E. KEENEY, DEPUTY ASSISTANT SECRETARY FOR OCEANS AND ATMOSPHERE, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION , U.S. DEPARTMENT OF COMMERCE

Good morning, Mr. Chairman, and members of the Subcommittee. I am Timothy Keeney, Deputy Assistant Secretary for Oceans and Atmosphere at the National Oceanic and Atmospheric Administration (NOAA). I am Co-Chair of both the Aquatic Nuisance Species Task Force and U.S. Coral Reef Task Force and am pleased to be here today to discuss both of these important issues. The U.S. Ocean Action Plan outlines the importance of both of these topics with specific goals of promoting coral reef conservation as well as preventing the spread of invasive species. Today, I will discuss the Coral Reef Conservation Act of 2000 (the Act), and the importance of its reauthorization as well as present NOAA's views on S. 363, which would amend the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (NANPCA), to establish vessel ballast water management requirements.

Reauthorization of the Coral Reef Conservation Act

Coral reefs, often called the "rainforests of the sea," are among the oldest and most diverse ecosystems on the planet. Coral reefs provide resources and services worth over $375 billion each year to the United States economy and economies worldwide, a surprising amount considering these ecosystems cover less than 1 percent of the Earth's surface. Coral reef resources provide economic and environmental benefits in the form of food, jobs, natural products, pharmaceuticals, and shoreline protection. Ten-and-a-half million people in the United States live in coastal communities adjacent to coral reefs (U.S. Census 2002). Consequently, coral reefs have become an integral part of the culture, heritage, and economies of these regions. Unfortunately, a combination of stressors has caused a rapid decline in the health of many coral reefs globally.

Congress recognized the need to preserve, sustain, and restore the condition of coral reef ecosystems by passing the Coral Reef Conservation Act of 2000, calling for the creation of a national strategy and program to address the threats to coral reef communities. The Act calls for NOAA to carry out a number of activities to promote the management and sustainable use of coral reef ecosystems, to develop sound scientific information on the condition of coral reef ecosystems, and to assist in the preservation of coral reefs by supporting external conservation programs.

The authority and guidance provided in the Act has allowed NOAA to undertake a number of activities important to understanding and conserving coral reef ecosystems. The Act authorized the establishment of a national program to fund and conduct activities to conserve coral reefs, which led to the creation of NOAA's Coral Reef Conservation Program (CRCP). The CRCP draws experts together from across NOAA and engages external partners to develop integrated strategies to address coral reef decline. In addition, the CRCP works with scientific, private, government, and non-government partners to address coral reef conservation on local, national, and international scales. One of the first tasks of the CRCP was to develop the National Coral Reef Action Strategy (National Action Strategy), as called for in the Act. The National Action Strategy established 13 goals, 4 to improve our understanding of reef ecosystems and 9 to reduce impacts of human activities. The National Action Strategy builds on the U.S. National Action Plan to Conserve Coral Reefs adopted by the U.S. Coral Reef Task Force (USCRTF) in 2000, and provides the roadmap for sustaining coral reef ecosystems, and the communities and economies that depend on them.

One of the mandates of the Act, and goals of the National Action Strategy, is to map and characterize U.S. shallow water coral reefs. The goal is to map all shallow reefs by 2009, and to date, NOAA has mapped approximately 66 percent; only Flor-

ida reefs remain to be mapped. These habitat maps provide scientists and managers basic information about coral reef ecosystems, assisting them in designing research and management plans, assessing damaged corals, monitoring reef health, and evaluating the results of their work.

The Act and the National Action Strategy also call for NOAA to partner with other Federal agencies, and state and territorial governments to build an integrated coral reef observing system to monitor, track and report on the condition of the ecosystem over time. This information is used to assess and adapt management actions. In 2002, NOAA worked with Federal, state, territorial, and commonwealth partners to produce the first *State of Coral Reef Ecosystems of the United States and Pacific Freely Associated States* report. This report assessed the condition of U.S. coral reefs, ranked threats, detailed ongoing conservation actions taken by Federal agencies, and contained recommendations from coral reef managers. The second report, scheduled for publication this summer, will reflect more quantitative data obtained through collaborative monitoring programs.

The CRCP has developed the first NOAA-wide coral ecosystem research plan to set priorities and guide NOAA-funded coral reef ecosystem research for the next 5 years (FY 2005–2010), including the research conducted through grants and contracts. The Research Plan covers all coral reef ecosystems under the jurisdiction of the United States and the Pacific Freely Associated States, and incorporates direct input and review from partner agencies, state and territorial governments, coral reef managers, scientists, and other key stakeholders. The plan is intended to provide scientific information and tools for management of coral ecosystems, and is scheduled for completion in 2005.

CRCP efforts authorized by the Act have also addressed the threat to reefs from marine debris and abandoned vessels. Debris and vessels can cause physical harm to coral reefs through entanglement and collision, and thus are serious concerns in some regions of the United States. NOAA leads a partnership with the State of Hawaii, Department of the Interior (DOI), U.S. Coast Guard (USCG), nongovernmental, and many local organizations to remove and dispose of derelict fishing gear from the Northwestern Hawaiian Islands (NWHI). Since 2000, this effort has removed over 400 metric tons of marine debris from the NWHI. The removal of all major, existing accumulations of derelict fishing gear and other marine debris from the NWHI will be completed this year. Because derelict fishing gear continues to accumulate in this area, NOAA and our partners have been coordinating an international discussion on how to detect and remove derelict fishing gear from the open ocean. NOAA has also created an Abandoned Vessels Program to identify candidate wrecks for further attention and to initiate removal of the highest priority cases.

As required in the Act, outreach and education activities to build public awareness and local capacity are another way the CRCP promotes sustainable management of coral reef ecosystems. The CRCP has reached out to stakeholders by creating and distributing educational materials and by conducting workshops and training sessions. For example, NOAA has supported a series of coral reef fisheries management workshops. NOAA has also assisted state and territorial governments in enhancing their human resource capacity for marine resource management by providing technical training for managers, by creating internship/fellowship programs, and by providing direct funding to support management staff.

The U.S. states, territories, and commonwealths, through the USCRTF, developed three-year Local Action Strategies (LAS) to promote collaborative on-the-ground management of threats to coral reefs. These LAS are locally-driven roadmaps for collaboration and cooperation among Federal, state, territory, and nongovernmental partners that identify and implement priority actions needed to reduce key threats to valuable coral reef resources. Florida, Hawaii, Guam, the U.S. Virgin Islands, American Samoa, Puerto Rico, and the Commonwealth of the Northern Mariana Islands each created specific LAS for select, locally-relevant, threats using six priority focus areas: overfishing, land-based sources of pollution, recreational overuse and misuse, lack of public awareness, climate change and coral bleaching, and disease. Additional focus areas were identified in some jurisdictions including: invasive species in Hawaii, population pressure in American Samoa, and maritime industry and coastal construction impacts in Florida. With assistance from NOAA and other Federal agencies, these jurisdictions completed LAS for selected priorities in 2004, and will be implementing the various projects through 2007. The Administration strongly supports the local jurisdictions' efforts. As part of the U.S. Ocean Action Plan, the Administration has requested funding in the Fiscal Year 2006 NOAA and DOI budgets to support implementation of the LAS.

The CRCP supports local reef management and conservation efforts through grant programs authorized by the Act. The comprehensive grants program supports a wide range of coral reef conservation projects both nationally and internationally.

NOAA's CRCP grants are awarded in six categories: State and Territory Coral Reef Management; State and Territory Coral Reef Ecosystem Monitoring; General Coral Reef Conservation; Projects to Improve or Amend Coral Reef Fishery Management Plans; International Coral Reef Conservation; and Coral Reef Ecosystem Research. These projects have advanced important conservation activities, such as the LAS, local capacity building, publication of educational materials, implementation of school marine science programs, identification and mapping of essential fish habitats, and the promotion of sociological assessments of marine protected areas. Between 2002 and 2004, NOAA awarded 133 grants to external partners in the public, private, and nonprofit sectors providing $15,650,145, and leveraged an additional $5,821,553 through matching funds. The awarded funds represent over thirty percent of the CRCP budget for Fiscal Year 2004. NOAA plans to award an additional $4,550,000 in Fiscal Year 2005 through the CRCP grant program.

As authorized by the Act, NOAA has partnered with the National Fish and Wildlife Foundation (NFWF) to administer the Coral Reef Conservation Fund. Over the past 4 years, this partnership has leveraged $2 million in CRCP funds into more than $9 million awarded in Federal and non-Federal matching funds for 116 coral conservation projects in 20 countries, five U.S. trusts or territories, and four U.S. states. The Coral Reef Conservation Fund is designed to foster public-private partnerships and to promote site-based conservation efforts. These grants foster integrated resource management and have advanced the development of tools to address threats to coral reefs throughout U.S. and international waters.

NOAA, as directed by the Act and the National Action Strategy, also supports and participates in international coral reef conservation. NOAA promotes improved human and institutional capacity to manage and conserve coral reefs internationally through technical assistance and its international coral small grants program. NOAA participates in multiple international efforts such as the International Coral Reef Initiative (ICRI), which supports international coral reef research and management efforts, including the Global Coral Reef Monitoring Network that produces biennial Status of Coral Reefs of the World reports. Last year, NOAA worked in partnership with the scientific community and its partner agencies to put forward the U.S.'s successful bid to host the 2008 International Coral Reef Symposium, the largest international gathering of coral reef scientists and managers.

NOAA continues to play an active role in the U.S. Coral Reef Task Force (USCRTF). The USCRTF was established by Executive Order 13089, and is composed of twelve Federal agencies, seven states and territories, and the three Freely Associated States. Biannual meetings bring members together to discuss key issues, propose new actions, present progress reports, and update the coral community on past accomplishments and future plans. These USCRTF meetings provide a valuable venue for the exchange of information in which members can voice concerns about their coral reef conservation efforts and collaborate to find more effective alternatives. Many of NOAA's coral reef conservation efforts, such as the coral ecosystem research plan, are developed in partnership with the various Federal agencies, and state and territory governments on the USCRTF.

As I have outlined, the authority provided to NOAA under the Act has yielded many benefits to coral reef management and protection. The Administration recognized the importance of conserving corals in the U.S. Ocean Action Plan released on December 17, 2004. The President's Fiscal Year 2006 budget request includes $27.2 million for the Coral Reef Conservation Program, including the $1.5 million in new funding to further implement LAS mentioned earlier. NOAA's continuing coral reef conservation efforts will include forming new international partnerships and fostering coral protection by recreational interests. NOAA is coordinating with partner agencies on the recently re-established marine debris committee to address this critical issue. In addition, NOAA is continuing the process to designate the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve as the fourteenth National Marine Sanctuary.

Recent accomplishments represent only intermediate steps toward achieving the goals of the National Coral Reef Action Strategy. Much remains to be done to halt the degradation of coral reefs and to sustain these valuable marine ecosystems and the economies that depend on them. Reauthorization of the Coral Reef Conservation Act is an important step in continuing this work to protect and restore coral reefs in the United States and abroad. Reauthorization would allow continuation of important NOAA-sponsored mapping, monitoring, research, and management efforts through the CRCP national and grants programs, and the Coral Reef Conservation Fund partnership with NFWF.

While the Act has allowed NOAA to develop an effective coral program, there are some limitations to the current Act that if addressed could significantly advance ef-

forts to reduce threats and conserve our valuable coral reef resources. Some limitations and hurdles posed by the current Act language are described below.

Every year many boats run aground on coral reefs causing significant damage to these fragile ecosystems. These vessel groundings are not well documented in all regions, but where recorded the numbers are astounding. For example, over seventy boat groundings occur annually in the Florida Keys National Marine Sanctuary alone, of which approximately four cause significant damage to the reefs and consequently require major damage assessments and restoration activities. Although the Federal Government has authority to address coral reef damage from groundings in designated protected areas, such as national parks and national marine sanctuaries, no similar authority exists to respond to any grounding that occurs outside of designated protected areas. Appropriate authority in the Act would enable NOAA, or other appropriate agencies, to respond to events, and recover from the responsible party, the costs for both this response and, where warranted, comprehensive damage assessment and restoration activities.

The Administration and Congress have recognized the value of the CRCP. It would be appropriate to recognize this support by authorizing the Act at the President's Fiscal Year 2006 request level of $27.2 million, and ensure that an adequate portion of this funding is available for effective program administration. Further, the current language allocating the appropriations between the grant and the national programs is confusing and contradictory. This language requires clarification, which could be accomplished by either outlining how funding should be allocated across all sections of the Act, or by providing NOAA the discretion to make allocation decisions.

NOAA would like to work with the Committee to find an appropriate way to provide Congress updates and information on the coral programs, without diverting too many resources from accomplishing the core missions of these programs. Also, although the Act provides the authority for NOAA to give emergency grants for addressing unforeseen or disaster-related circumstances, we have never implemented this provision and are potentially restricted from doing so. Due to the amount of time that it takes to process a grant, this is not an appropriate vehicle for responding to an emergency situation.

S. 363, Ballast Water Management Act of 2005

Nonindigenous species are affecting habitats and species on all of our coasts, and introductions of new species can alter both physical habitat and impact native species and ecosystem productivity. For example, last year, the State of Ohio shut down its Great Lakes smallmouth bass fishery for the months of May and June—two of the largest months for their recreational fishery. The closure surprised the public because the cause was a fish much smaller than the smallmouth bass—the round goby, a ballast water introduction. The male smallmouth bass protect the smallmouth bass nests from predators. When the males are removed, large numbers of round gobies move in and prey on the eggs—jeopardizing the smallmouth bass fishery.

Another example of direct predation is the introduction of the green crab. When the green crab moved into the Gulf of Maine in the 1940s and 1950s, it contributed to the collapse of the soft-shell clam fishery. It was recently introduced to the West Coast, where it might affect Dungeness crab populations and shellfish aquaculture. Initial studies have already shown declines in abundance of native crab and bivalve populations in areas where the green crab has been established.

Introduction of an invasive species can cause disruption of a food chain and have cascading impacts. In the northern portion of San Francisco Bay, a very small clam species—*Potamocorbula amurensis*—has become so abundant and is such an efficient filter feeder that phytoplankton are no longer abundant. The next step up the food chain is the zooplankton that feed on the phytoplankton. Significant declines in the abundance of zooplankton and mysid shrimp have now been documented. In turn, these organisms are prey for juvenile fish species.

NOAA's Great Lakes Environmental Research Laboratory has documented a similar food chain disruption in the Great Lakes. In some areas, up to 75 percent of the benthic biomass is made up of *Diporeia* species, small amphipod crustaceans that are a primary prey-source for fish species such as the whitefish. In areas where zebra mussels are present, *Diporeia* have virtually disappeared and whitefish are showing signs of nutritional distress.

I would like to update the Subcommittee on our progress in addressing the ballast water issue. During the 1996 reauthorization, NOAA and the U.S. Fish and Wildlife Service (FWS) were charged with sponsoring research to develop new technologies for ballast water management. Although primary responsibility for this program lies with FWS and NOAA, a number of different Federal agencies have been cooperating

on ballast water issues. The U.S. Department of Transportation Maritime Administration (MARAD) deserves particular recognition. Despite not being mentioned in the existing statute, MARAD has volunteered testing platforms for research projects. Each year NOAA, FWS, and MARAD put out a joint request for proposals for ballast water technology development projects with a joint peer-review process for selection. In addition to this process, other Federal agencies involved in evaluating technologies and setting priorities include the USCG, the Environmental Protection Agency (EPA), the U.S. Geological Survey, and the Department of Defense.

Since 1998, 54 research projects have been sponsored under the Ballast Water Demonstration Program. Sixteen additional ballast water-related projects have been sponsored through the National Sea Grant College Program aquatic nuisance species competition. Among the technologies that have been tested are filtration, ultraviolet radiation, ozone injection, sonic bombardment, heat treatment, and oxidizing and non-oxidizing biocides. We are well beyond proof of concept with many of these technologies, and there are some promising results.

Even as we have begun to address the development of new technologies, new issues have arisen concerning ballast water. In the Great Lakes region, there is considerable concern over vessels with no ballast onboard (NOBOB). While fully loaded vessels may declare no ballast onboard, organisms may still be present in residual water and sediments at the bottom of the tank. These organisms may be resuspended as cargo is unloaded and ballast water is added to compensate. In 2001, NOAA's Great Lakes Environmental Research Laboratory identified NOBOB ships as a high priority research need. They organized a large multi-institutional research project with multiple sponsors to directly characterize and assess the invasion risk from ballast water discharges associated with NOBOB vessels operating in the Great Lakes. In addition to looking at the NOBOB issue, the program also looked at the efficacy of ballast water exchange.

The final report of the NOBOB Assessment program found that ballast water exchange can be highly effective for reducing concentrations of organisms entrained with coastal ballast water, and although it remains imperfect, it is generally a beneficial management practice in the absence of more effective management tools. The assumption that "salinity shock" is an additional advantage for protecting the Great Lakes ecosystem from invasive species must be viewed with some caution and requires further examination. The effectiveness of "salinity shock" in eliminating freshwater-tolerant organisms varied widely depending on the types and forms of organisms that are present in ballast tanks, including whether the organism is in a resting, larval, or adult stage. While "salinity shock" may be a useful tool, like ballast water exchange, it is imperfect.

As you can see, the introduction of non-indigenous species is an issue of great importance. The 1990 NANPCA initially focused on ballast water and the Great Lakes. The 1996 National Invasive Species Act provided voluntary guidelines for the rest of the country with provision for regulatory action if the voluntary guidelines were not effective. As you know, the USCG made a formal finding that the voluntary guidelines were not effective and issued regulations requiring ballast water management for vessels entering U.S. ports from beyond the Exclusive Economic Zone (EEZ). Currently, the only practical method of management is ballast water exchange, but all stakeholders recognize that this is an interim solution until methods for treating ballast water are developed.

NOAA supports the goal of S. 363, which is to reduce the risk of introducing new invasive species by ballast water. While S. 363 addresses the issues associated with ballast water, NOAA is concerned that it only amends section 1101 of NANPCA. While NOAA notes that the entire NANPCA is due for reauthorization, we acknowledge that ballast water is a highly time-sensitive issue, and therefore, understand the need for narrowing the focus of legislation such as S. 363.

I would like to focus on a few of the sections of S. 363 that we feel warrant special attention. S. 363 includes two separate administrative procedures for determining acceptable exchange zones. The bill provides for ballast water exchange in water that is at least 50 nautical miles from land and 200 meters in depth. The USCG—in consultation with NOAA and EPA—is responsible for issuing limitations on ballast water exchange in these areas. However, the designation of alternate exchange zones within 50 nautical miles from land and 200 meters in depth is the responsibility of NOAA, in consultation with USCG and EPA. Because the USCG is the primary regulatory authority for ballast water exchange and will be responsible for enforcement, NOAA recommends the USCG be the lead for both procedures after consultation with NOAA and EPA.

NOAA also would like to express concern over one of the definitions in Section 3(b)(5). This section proposes a new paragraph 13 for Section 1003 of the NANPCA defining "harmful aquatic organisms and pathogens." Under the proposed definition,

these are organisms determined by the Secretary to cause an adverse impact if introduced. Such determinations and creation of a list of organisms would not be useful in the context of ballast water management and could require significant resources. In the case of ballast water, literally thousands of species could be introduced, and the biological information for many is insufficient to assess whether they will become invasive or cause adverse impacts. To put this in context, James Carlton, one of the leading theorists on invasion biology, once said that zebra mussels would not have been an obvious choice for a list of potential invaders. He pointed out that prior to the late 1980s they probably had been carried in ballast water. However, only when a combination of ecological conditions and concentration of organisms was present did they become established. Because of the difficulties of distinguishing harmful organisms from benign ones, virtually all treatment and management options are designed to remove or inactivate all aquatic organisms, and we therefore recommend revision of the definition to reflect this reality.

Considerable progress has been made in addressing the ballast water problem since the 1996 reauthorization, but much work remains. The Fiscal Year 2006 President's budget requests $7.9M to continue NOAA's valuable work to prevent invasive species through programs such as the Aquatic Invasive Species Program, Sea Grant, the Great Lakes Environmental Research Lab, and National Center for Coastal Ocean Science. This includes augmenting research to significantly advance the techniques available to stop invasive species transfer through ship ballast water. I urge you to support this request. As we learn more, new issues will arise. The emerging issue of coastwise traffic, which involves ships that never move out of the 200-mile EEZ and are not required to exchange ballast water, magnifies the importance of new treatment technologies. However, with a strong commitment, I think that we will be able to significantly reduce the risks associated with ballast water as a vector for the introduction of new species.

Conclusion

That concludes my testimony, Mr. Chairman. I would be happy to respond to any questions that the Subcommittee may have.

The CHAIRMAN. Thank you, Mr. Keeney. Our next witness is Kim Hum, the Coastal Marine Program Director at The Nature Conservancy of Hawaii. Welcome.

STATEMENT OF KIM HUM, DIRECTOR, COASTAL MARINE PROGRAM, THE NATURE CONSERVANCY OF HAWAII

Ms. HUM. Thank you. Chairman Sununu, Senator Boxer, Senator Inouye. Aloha. My name is Kim Hum. I'm the Coastal Marine Program Director for The Nature Conservancy of Hawaii's Program. If any of you have ever read a self-improvement book, you know that they tell you to take risks and get out of your comfort zone, so I'd like to thank you for this opportunity to get out of my comfort zone and testify before you today on reauthorization of Coral Reef Conservation Act of 2000. I'm not here as a scientific expert but as a practitioner; as someone who's responsible for implementing coral reef conservation in the field in Hawaii. And I'm honored to have this opportunity to talk with you about the work we've been doing in Hawaii and what more needs to be done with support from NOAA under the Coral Reef Conservation Act.

The Hawaiian archipelago and associated reefs stretch more than 1,500 miles from the island of Hawaii in the southeast, to Kure Atoll in the Northwest Hawaiian Islands. Hawaii is the most isolated landmass on earth, 2,500 frequent flyer miles away from the mainland U.S. This geographic isolation has resulted in one of the highest levels of endemism in the world. Twenty-five percent of the marine species found in Hawaii are found nowhere else on earth. This means that if we lose them in Hawaii, they are gone from the world forever. And yet Hawaii's reefs face many of the threats faced by reef systems around the world; over-harvesting, coastal

development, polluted runoff, invasive species, bleaching, and disease. Combining these threats have led to a 75 percent reduction in near-shore fisheries in the Hawaiian islands over the past 100 years.

Our job in Hawaii, across the Nation, and around the globe, is to work with our partners to reverse this trend and ensure that our coral reefs and associated near-shore fisheries are sustainable for generations to come. So while I am going to speak today about our work in Hawaii, I hope you will be thinking about how this work can serve as a model in your states and other coastal states around the country.

With the support of NOAA's coral reef program, The Nature Conservancy launched a marine program in 2002, to begin to address the most urgent threats to Hawaii's coral reefs. Over the past 3 years we've initiated a marine GAP program to collect and manage information about the location and status of Hawaii's marine resources, identify the top three coral reef priority sites for protection on each of the main Hawaiian islands, brought together more than 80 community members from 15 local communities to share strategies for coral reef conservation in annual workshops, developed a Makai Watch program focused on training local community members to provide education and outreach to marine resource users, surveillance and enforcement of marine resource protection laws, and monitoring of coral reef resources. We've established reef funds on two islands with local dive and snorkel operators who solicit voluntary donations from their clients for private coral reef conservation efforts. And we supported more than 15 other local community efforts to understand and manage reef resources, including the reestablishment of traditional Hawaiian opelu fishing in a traditional coastal fishing village on the Big Island of Hawaii, and interviews with kupuna, Hawaiian elders, around the state about the status and decline of near-shore fisheries. And we've been able to accomplish all of this with $125,000 in annual funding from NOAA which has leveraged more than $350,000 annually in private sources and hundreds of hours of community volunteer time for coral reef conservation in the islands.

While we're proud of these accomplishments and the partnerships we have built over the past 3 years and grateful for the support from NOAA and our Congressional delegation, it's clear there's a great deal more to be done. Over the next 5 years we will expand on our past work with NOAA, with state, and our community partners in three main areas: moving from three priority sites on each island to developing a resilient network of marine managed areas encompassing at least 20 percent of near-shore waters, building on the success of our Makai Watch program to engage coastal communities throughout the network in coral reef conservation, and expanding the reef funds to include a larger sector of the tourism industry on each of the main islands with the goal of raising $1 million annually in private funding for coral reef conservation on the islands.

In our written testimony, we have provided recommended additions to the Coral Reef Conservation Act to support these efforts and efforts like them around the country. While all of the recommendations are important, I would like to highlight the need for

increased funding authorization. NOAA has done a tremendous job implementing the Coral Reef Conservation Act with the funding they have had over the past 5 years. They have exponentially advanced our understanding of the extent and health of U.S. coral reefs and built unprecedented interagency cooperation through the Coral Reef Task Force.

However, additional funding is needed for them to continue their good work and build state and NGO capacity for local reef conservation efforts, including a new $10 million grant program to engage local community members in reef management in a meaningful way. Increased funding should also support state efforts to develop resilient networks of scientifically-designed marine-managed areas which have been shown to increase the health of coral reefs and near-shore fisheries in about 80 places around the world. We believe that these and the other changes recommended in our written testimony will enable NOAA and their partners to make tremendous strides toward protecting our Nation's coral reefs. *Mahalo* for the opportunity to testify.

[The prepared statement of Ms. Hum follows:]

PREPARED STATEMENT OF KIM HUM, DIRECTOR, COASTAL MARINE PROGRAM, THE NATURE CONSERVANCY OF HAWAII

Mr. Chairman and members of the Committee, *aloha* and *mahalo* for the opportunity to testify on the reauthorization of the Coral Reef Conservation Act of 2000. My name is Kim Hum, and I am the Director of the Coastal Marine Program for The Nature Conservancy of Hawaii. I am honored to have this opportunity to inform you of the work we've been doing with our partners in Hawaii to conserve coral reefs, what more needs to be done, and what it's going to take to ensure that our reef resources are sustainably managed for generations to come.

The mission of The Nature Conservancy is to preserve the plants, animals, and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. With the support of more than 1 million members, The Nature Conservancy has protected more than 120 million acres and 5,000 river miles around the world. We currently have more than 100 marine conservation projects in 21 countries and 22 U.S. states. Through its work with both freshwater and marine species and habitats, the Conservancy helps to connect terrestrial, freshwater, and marine conservation efforts by building on the Conservancy's network of partners and innovative approaches developed at sites around the world to pursue integrated coastal conservation.

I would like to start by commending NOAA for the incredible progress they have made identifying, mapping, and protecting coral reefs throughout the U.S. over the past 5 years. They have exponentially advanced our understanding of the extent and health of U.S. coral reefs, and built unprecedented interagency cooperation through the Coral Reef Task Force in our efforts to protect and restore coral reefs. They deserve our respect and continued support for their work.

Coral Reef Conservation Efforts in Hawaii

NOAA has a big job in Hawaii. The Hawaiian archipelago and associated reefs stretch more than 2,500 kilometers (1,500 miles) from the island of Hawaii in the southeast, to Kure Atoll in the northwest. Hawaii's geographic isolation has resulted in one of the highest levels of marine endemism in the world—25 percent of the marine species found in Hawaii are found nowhere else on Earth—so if we lose them in Hawaii, they are gone from the world forever. This isolation also means that the Hawaiian reefs are almost exclusively self-dependent for replenishment. They are not repopulated from other reefs following depletion of their fish stocks or damage from storms and other large scale catastrophes. This raises the stakes on the need to fortify the resilience of our reefs and to manage them exceptionally well through a series of integrated conservation and management actions.

Hawaii's coral reefs are essential for our islands' physical and economic survival—they protect us from storm waves, create our world famous surf and beaches, provide food and recreation for our residents, and are the basis for the state's $11 bil-

lion [1] tourism industry, including $800 million annually in marine tourism alone. And yet, Hawaii's reefs face many of the threats faced by reef systems around the world—over harvesting, coastal development, polluted runoff, invasive species, bleaching, and disease. NOAA, indeed, has a big job in the islands.

With the support of NOAA's Coral Reef Program, The Nature Conservancy launched a Marine Program in 2002, to begin to address the most urgent threats to Hawaii's coral reefs. We began by commissioning a study of the status of private conservation efforts in Hawaii, and learned that the three biggest needs are to:

1. Identify the most important coral reef systems in Hawaii,
2. Build community capacity to protect and manage reef resources, and
3. Develop sustainable private funding mechanisms to ensure the long term viability of community-based coral reef conservation programs.

These three strategies have guided our program development over the past 3 years, and with support from NOAA's Coral Reef Conservation Program, we have:

- Worked with NOAA and the State to initiate a marine GAP program to collect and manage information about the location and status of Hawaii's marine resources.
- Identified the top three action sites on each island through a rapid strategic planning process that included a comprehensive literature review, information gathered from the marine GAP database, and extensive expert interviews.
- Brought together more than 80 community members from 15 local communities who are actively engaged in marine conservation projects into a learning network with annual workshops focused on sharing strategies for marine conservation.
- Developed and piloted a *Makai* Watch Program focused on training local community members to provide (1) education and outreach to marine resource users, (2) surveillance and enforcement of marine resource protection laws, and (3) monitoring of coral reef resources. *Makai* Watch is now a priority of the state Department of Land and Natural Resources (DLNR) because they recognize the power of an engaged community committed to natural resource protection.
- Established "Reef Funds" on two islands with local dive and snorkel operators who solicit voluntary donations from their clients to support private coral reef conservation efforts. To date, these funds have supported the repair and installation of mooring buoys on the islands of Lanai and Maui, staffing for the Big Island Reef Fund, and development of an educational website designed to inform ocean users of laws and best practices governing their use of coral reefs and other marine resources.
- Supported more than 15 local community efforts to understand and manage reef resources, including human-use surveys on Kauai and the Big Island to determine human-based threats to the resources, surveys of the offshore islets surrounding the main Hawaiian Islands, reestablishment of traditional *opelu* fishing methods at a local community on the Big Island, interviews with *kupuna* (Hawaiian elders) around the state about the status and decline of near-shore fisheries, and many other community-based projects.

We have been able to accomplish all of this with $125,000 each year from NOAA, which has leveraged more than $350,000 annually from private sources, and hundreds of hours of community volunteer time for coral reef conservation in the islands.

While we are proud of the record of accomplishment and the partnerships we have built over the past 3 years, and grateful for the support from NOAA and our delegation, it is clear that there is a great deal more to be done. Over the next 5 years, the Conservancy plans to expand on our past work with partners into three main areas:

- Complete an eco-regional assessment for marine areas in Hawaii as a framework for expanding our conservation efforts;
- Building on the success of the *Makai* Watch, and the results of our eco-regional plan to enhance community engagement in resource conservation, and to broaden our partnership with the state.
- Identify opportunities to increase resources for coral reef conservation.

[1] Department of Business, Economic Development & Tourism—Research and Economic Analysis Division.

Currently, the Conservancy has identified priority marine sites on each island where we will focus the majority of our efforts. However, we are currently developing a comprehensive eco-regional assessment that will more thoroughly review the status and threats to coral communities in Hawaii. While we have seen some success in coral conservation on a site by site basis—the survival of coral reefs relies upon their health, resilience, and ability to repopulate. This will only be achieved through a series of integrated conservation and management actions. Based on this we plan to work with NOAA and the state to expand our strategic plan from three sites on each island to develop a network of Marine Managed Areas in the main Hawaiian Islands. We will address unique threats at each network site as appropriate.

The Conservancy sees its partnerships with the state and local communities as the most effective means to achieve our conservation objectives. We anticipate that the strategies to address threats identified through our science efforts will be successful only if implemented in partnership with communities. We will work to build upon the success of *Makai* Watch at developing community capacity to protect coral reefs by implementing it in high-priority coastal communities around the state in partnership with DLNR.

Finally, while we are grateful for Federal support for these efforts, and have good success at raising funds from private sources—the challenge of paying for these efforts is daunting. We will work to develop additional funding sources including expanding the Reef Funds to include a larger sector of the tourism industry on each of the main islands, with the goal of raising $1 million annually in private funding for coral reef conservation.

Coral Reefs Are a Priority for The Nature Conservancy

Across the oceans, The Nature Conservancy is promoting a worldwide effort to conserve coral reefs and the rich diversity of life in tropical waters. By helping create networks of ecologically-connected protected areas that are resilient in the face of growing local and global stresses, we can ensure the survival and long-term viability of Earth's invaluable coral reefs.

The Conservancy's marine program in Hawaii is part of a broader effort across the Conservancy to address threats to coral reefs. Drawing on input from the world's experts on coral reefs, The Nature Conservancy has created a vision for tropical marine conservation that enhances the prospect of survival for coral reefs. This vision will catalyze efforts to:

- Expand the area of coral reef and related habitats that is protected;
- Improve the effectiveness and financial security of tropical Marine Managed Areas; and
- Build the principles of resilience into design and stewardship of managed areas.

In the Pacific, together with local communities, non-governmental partners and local, regional, state and Federal governments, the Conservancy is currently working to identify and help to manage biologically-important marine areas, not only in Hawaii, but in the Freely Associated States—Federated States of Micronesia and Palau, the Republic of the Marshall Islands—as well as Papua New Guinea, Indonesia, and the Solomon Islands. Coral reefs in the Pacific are essential to the food security of the region's coastal population today, and their hope for a better future for tomorrow—a future in which reefs continue to provide the fish for protein, and a resource that can form the basis for the increasingly important tourism sector so important to many Pacific nations. The Conservancy and other international NGO's are developing partnership agreements with national governments to assist these countries in developing networks of managed areas, to help assure the health and resilience of their coral reef resources.

These efforts have yielded not only conservation results, but have improved our understanding and provide insights to managers in other jurisdictions about the science of coral reef conservation. They have also taught important lessons about the need to work closely with communities to ensure conservation strategies support, and are informed by, socio-economic realities. The Conservancy has worked closely with the Coral Reef Task Force so that these experiences may inform their efforts, but also to lend our science, capacity, and resources to address shared priorities in the U.S. states and territories.

Recommendations

The Conservancy supports a strong reauthorization of the Coral Reef Conservation Act. NOAA's work under this Act has been essential to the progress made to date. We look forward to working with the Committee on reauthorization and are pleased to offer some general recommendations today.

Increased funding. Authorization for appropriations under the Act should be increased and the purposes expanded. Increased funding for grants to support mapping, planning, implementation, and monitoring is essential. Additionally, the Act should be expanded to include a specific authorization for the Department of the Interior—both through the Office of Insular Affairs, which supports work in the territories and Freely Associated States, and the U.S. Fish and Wildlife, which manages coral reefs under several of its maritime National Wildlife Refuges.

Marine Managed Areas Network. Networks of scientifically-designed managed areas have been shown to increase the health of coral reefs and associated nearshore fisheries in more then 80 places around the world. Development of such a network throughout the United States should be a top priority for NOAA's coral program, and funding priority should be given to states and territories for development and implementation of a NOAA-approved Managed Areas plan, and management and enforcement of existing managed areas that are part of a NOAA-approved Managed Areas plan.

Interagency Cooperation. No one agency has the ability to abate all of the threats to coral reef ecosystems in all of the places where they happen. For example, the Fish and Wildlife Service (FWS) is responsible for managing more than 700,000 acres of coral reefs in 10 refuges throughout Hawaii and the Pacific, with minimal funding from the Department of the Interior. Therefore, interagency cooperation is essential to successful implementation of the strategies outlined in this Act, and the Coral Reef Action Strategy, and all of the agencies that are responsible for coral reef management should be eligible for funding under the Act. Mechanisms for interagency cooperation, like the Coral Reef Task Force, should be supported through the Act, and include national and international NGO's like The Nature Conservancy, which bring a unique perspective and global experience to coral reef conservation.

Regional Coordination and Cooperation. In addition to the national planning and cooperation necessary for successful protection of our Nation's reef resources, NOAA should be given the authority to coordinate with states, territories, and NGO's for regional, ecosystem-based planning that builds upon the national coral reef action strategy, and addresses multiple threats to coral reefs, such as over-harvesting, coastal runoff, invasive species, and vessel impacts.

With these changes, we believe the Coral Reef Conservation Act will enable us to make tremendous strides toward protecting our Nation's coral reefs.

Thank you for the opportunity to provide input on the Coral Reef Conservation Act. I would be happy to answer any questions.

The CHAIRMAN. Thank you very much. And our final witness is Maurya Falkner of the Marine Invasive Species Program within the California State Lands Commission. Welcome, and thank you for your testimony.

STATEMENT OF MAURYA B. FALKNER, PROGRAM MANAGER, MARINE INVASIVE SPECIES PROGRAM, CALIFORNIA STATE LANDS COMMISSION (CSLC)

Ms. FALKNER. Good morning and thank you, Mr. Chairman, and members of the Subcommittee. I am the Program Manager for the Marine Invasive Species Program in California State Lands Commission and have been asked to provide testimony this morning on our efforts to manage ballast water in the State of California, and based on those experiences, some recommendations for developing any national ballast water management program. California State Lands Commission has significant experience working to prevent and control the establishment of non-indigenous species via ballast water discharges. The 1999 Ballast Water Management for Control of Non-indigenous Species Act, Assembly bill 703, charged the commission with oversight of the state's first mandatory program to prevent non-indigenous species introductions through ballast water discharged by commercial vessels. Upon the sunset of the Act, the Marine Invasive Species Act, Assembly bill 433, was passed in 2003, revising and widening the scope of the Commission's program

to more effectively address the non-indigenous species threat. Due to our continued and expanded intensive outreach by staff and utilization of technical advisory groups, a monthly electronic notification system along with daily interactions with maritime industry and the potential for civil and criminal penalties, compliance with the California Act has continued to improve, exceeding 95 percent in all components. The program's success and relatively weak Federal program supports the continuation of the California Marine Invasive Species Program.

My written testimony provides a great deal more detail on the California program and the successes that we've had, so now I'm going to turn my attention to some of the experiences that we've had in California and our recommendations for the Federal lawmakers.

First, we believe that ballast water management requirements should apply to all voyages including those operating inside the U.S. EEZ. It's widely recognized that transport of non-indigenous species is not restricted to voyages arriving simply from outside the EEZ. For example, on the West Coast, a highly invaded area such as San Francisco Bay, can serve, and does serve, as a hub for non-indigenous species transport to other Pacific Coast region ports such as Los Angeles and Portland. So we recommend that the lawmakers consider all voyages and not just those from outside the EEZ.

Ballast water exchange is also widely considered an interim management tool and as the Admiral mentioned it's going to be phased-out eventually with the IMO standards. We are mandated under our Act put forward performance standards recommendations for our legislature to consider, and we have developed a panel that spends a significant amount of time evaluating the standards adopted by the IMO Convention and discharge standards that have been proposed in U.S. legislation, specifically, the Ballast Water Management Act of 2005. We applaud IMO's steps forward on this issue by focusing on a concentration-based performance standard, however, the standard that's being proposed provides very little protection, if any, beyond unmanaged ballast. Work that's been done looking at unmanaged ballast water indicates that—suggests that the IMO standard is only at very best going to decrease zooplankton concentrations by one order of magnitude and will do nothing for phytoplankton concentrations, and this is for unmanaged ballast water, so it doesn't consider exchanged ballast water. We believe that the Ballast Water Management Act of 2005, is as we know a much stricter, concentration-based standard, and we believe that this should be adopted at least in the interim, or at least as an interim standard while other technologies are improving that performance.

We also believe that national legislation should look at ship mediated non-ballast water vectors, for example, hull fouling. There are several recent papers out suggesting that hull fouling may be as important if not more so than ballast water in at least certain estuaries. And there's very little work that's been done on hull fouling and we need to develop a better understanding of the risks of hull fouling and housekeeping practices that can minimize introductions via that route.

All of the things that I have been talking about under the additional items in my written testimony cost money, and so we believe that the legislation, whatever is put forward, needs to provide dedicated and secure funding for any kind of a national program. California chose to use a fee-based program. That works great in California. It may not be the answer nationally, but it does work and pays for all of our programs in California.

Finally, I'd just like to say that as the regulations are developed, the legislature should strongly consider the continued success of programs like the California Marine Invasive Species Program. Our program not only exemplifies the potential of state programs, but will complement and reinforce any Federal regulations on ballast water management. So preemption provisions may be beneficial in specific areas such as performance standards for treatment of ballast water, however, broad preemption language for state programs would be detrimental to the overall goal of controlling NIS introductions via commercial shipping.

Thank you for the opportunity to provide comments on this act and we look forward to working with the legislators in the future on this.

[The prepared statement of Ms. Falkner follows:]

PREPARED STATEMENT OF MAURYA B. FALKNER, PROGRAM MANAGER, MARINE INVASIVE SPECIES PROGRAM, CALIFORNIA STATE LANDS COMMISSION (CSLC)

Introduction

Good morning, my name is Maurya Falkner, and I am the Program Manager for the Marine Invasive Species Program at the California State Lands Commission. I have been asked to provide testimony today on state efforts to control the transfer of non-native species through ballast water management as well as on efforts to meet or exceed the standards and timetables agreed upon in the International Maritime Organization's recently adopted Convention on Ballast Water Management.

California State Lands Commission (CSLC) has significant experience working to prevent and control the establishment of nonindigenous species via ballast water discharges. The 1999 Ballast Water Management for Control of Non-indigenous Species Act (Assembly Bill 703) charged the CSLC with oversight of the state's first mandatory program to prevent non-indigenous species (NIS) introductions through the ballast water of commercial vessels. Upon the sunset of the Act, the Marine Invasive Species Act (AB 433) was passed in 2003, revising and widening the scope of the CSLC program to more effectively address the NIS threat. Under the new Act, the expanded Marine Invasive Species Program (MISP) continues to monitor compliance with the requirement to manage ballast water of foreign origin. In addition, the program has initiated administration of the following efforts:

- Adopt reporting and ballast water management requirements for all voyages in the Pacific Coast Region.
- Develop a program that supports the development of ballast treatment and management technologies.
- Initiate discussions and develop policy recommendations for ballast treatment system performance standards.
- Evaluate the risk of commercial vessel fouling as a means of NIS introduction, and formulate recommendations to reduce this risk.
- Coordinate and consult with sister agencies that administer other components of the Act (esp. Department of Fish and Game and Board of Equalization).

The stated purpose of the Marine Invasive Species Act is to move the state expeditiously toward elimination of the discharge of nonindigenous species into the waters of the state, or into waters that may impact the waters of the state, based on the best available technology economically achievable.

Overview

Non-indigenous species (NIS) are organisms that have been transported through human activities into regions where they did not occur in historical time, and successfully reproduce in the wild at their new location (Carlton 2001). Once established, such species can create negative economic, ecological, and human health impacts in their new environs. For marine and estuarine environments, the ballast water of ships is considered one of the major pathways through which foreign species are transported and spread (*Stemming the Tide,* 1996).

In response to this threat, the California Legislature passed Assembly Bill (AB) 703, the Ballast Water Management for Control of Nonindigenous Species Act in 1999. The law required that vessels originating from outside the United States Exclusive Economic Zone (EEZ) carry out mid-ocean exchange or use an approved ballast water treatment method, before discharging in California State waters. The California State Lands Commission's (CSLC) Ballast Water Management Program was tasked with several specific responsibilities:

- Receive and process ballast management reports submitted by all vessels arriving to California State waters from outside the EEZ.
- Monitor ballast management and discharge activities of vessels through submitted reports.
- Inspect and sample vessels for compliance with the law.
- Assess vessel reporting rates and compliance with the law.

In recognition of the uncertainties surrounding the development of an effective ballast water management program for the State, AB 703, specified a sunset date of January 1, 2004. During the 2003 Legislative session, the act was revised and recast as AB 433, the Marine Invasive Species Act (Act). Several recommendations identified during the administration of AB 703 and detailed in the program's first biennial report (Falkner 2003) were incorporated into the 2003 law. In accordance with the Act, the State program was renamed the Marine Invasive Species Program (MISP), and charged with several expanded responsibilities. Key among these are:

- Authorization to pursue criminal and/or civil penalties for violations to the law.
- Adopt ballast water management regulations for vessels originating from within the Pacific Coast Region.
- Adopt regulations for the evaluation and approval of experimental shipboard ballast treatment systems.
- Sponsor a pilot program that will evaluate the feasibility of ballast water treatment technologies.
- Recommend performance standards for ballast treatment systems, in consultation with an advisory panel.
- Evaluate the risk of non-ballast ship-based vectors for spreading NIS and recommend actions to prevent associated introductions, in consultation with a technical advisory group.

Shipping Vectors—Also know as "introduced," "invasive," "exotic," "alien," or "aquatic nuisance species," non-indigenous species (NIS) in marine, estuarine, and freshwater environments may be transported to new regions through numerous human activities. Intentional and unintentional introductions of fish and shellfish, aquaculture, illegal releases from the aquarium and pet industries, floating marine debris, bait shipping, and accidental release through research institutions are some of the mechanisms, or "vectors," by which organisms are transferred (U.S. Commission on Ocean Policy 2004). In coastal environments, commercial shipping is the most important vector for invasion, in one study accounting for one half to three-quarters of introductions to North America (Fofonoff *et al.* 2003). Vessels transport organisms through two primary sub-mechanisms: ballast water and fouling.

Ballast water is necessary for many functions related to the trim, stability, maneuverability, and propulsion of large seagoing vessels (*Stemming the Tide* 1996). Vessels may take on, discharge, or redistribute water during cargo loading and unloading, as they encounter rough seas, or as they transit through shallow coastal waterways. As ballast is transferred from "source" to "destination" ports, so are the many organisms taken into its tanks along with the port water. In this fashion, it is estimated that some 7,000 plus organisms are moved around the world on a daily basis (Carlton 1999).

Fouling organisms are associated with hard surfaces that are exposed to water. These include organisms that physically attach to vessel surfaces, such as barnacles, algae, and mussels, and also includes mobile organisms that associate with fouling communities, such as worms, juvenile crabs, and amphipods (small shrimp-like ani-

mals). Vessels that spend long periods in port or move at slow speeds, such as barges and floating dry docks, appear to accumulate more extensive and diverse fouling communities (Godwin *et al.* 2004, Minchin and Gollasch 2003, Godwin 2003). In some circumstances, fouling organisms have been observed to be in spawning condition at arrival ports (Coutts *et al.* 2003, Apte *et al.* 2000).

NIS Impacts—The rate, and thus the risk, of invasion has increased significantly during recent decades. The rate of reported invasions in North America increased exponentially over the last 200 years (Ruiz *et al.* 2000a). In the San Francisco Bay Estuary alone, a new species is believed to become established every 14 weeks (Cohen and Carlton 1998). One of the primary factors contributing to this increase is the expansion of global trade, and the technologies, which enable commodities to be transported swiftly and efficiently throughout the world. Along with goods, organisms are moved over land, air, and sea in larger numbers to more widespread locations, and are better able to survive the shortening excursions (Ruiz and Carlton 2003).

Once established, NIS can have severe ecological, economic, and human health impacts to the receiving environment. The most infamous example is the zebra mussel (*Dreissena polymorpha*) introduced to the Great Lakes from the Black Sea. They attach to hard surfaces in dense populations that clog municipal water systems and electric generating plants, resulting in costs of approximately a billion dollars a year (Pimentel *et al.* 2004). The Asian clam (*Potamocorbula amurensis*) spread throughout the San Francisco Bay and its tributaries 2 years after its introduction, and accounts for up to 95 percent of living biomass in some shallow portions of the bay floor (Nichols *et al.,* 1990). Like its Great Lakes counterpart, the Asian clam fouls power plant structures, costing approximately a billion dollars per year during the early 80s for control and losses (Lovell and Stone 2005). The Chinese mitten crab, (*Eriocheir siensis*) was first sighted in the San Francisco Bay in 1992, and quickly spread through the system, clogging pumping stations and riddling levies with burrows (Rudnick *et al.* 2000). Costs for control and research were $1 million in 2000–2001 (Carlton 2001). The European green crab (*Carcinus maenas*), thought to have caused the crash of the Maine softshell clam fishery, arrived in California during the mid-1990s (Grosholz and Ruiz 1995). There are fears that it will compete for food with the valuable Dungeness crab (*Cancer magister*) threatening the West Coast fishery. The microorganisms that cause human Cholera (Ruiz *et al.* 2000b) and paralytic shellfish poisoning (Hallegraeff 1998) have also been found in the water and sediments in ballast tanks.

Prevention Through Ballast Water Management—Attempts to eradicate NIS after they have become widely distributed are typically unsuccessful and costly (Carlton 2001). Control is likewise extremely expensive. For example, approximately $10 million is spent annually to control the sea lamprey (*Petromyzon marinus*) in the Great Lakes (Lovell and Stone 2005); $2.3 million was spent to control the Mediterranean green seaweed (*Caulerpa taxifolia*) in southern California during 2000–2001, and $2 million was spent in Washington to control Atlantic cordgrass (*Spartinia alterniflora*) between 1999–2001 (Carlton 2001). Prevention is, therefore, considered the most desirable way to address the issue.

For the vast majority of commercial vessels, open-ocean ballast exchange more than 200 nm offshore is the primary method of ballast water management. Currently, it is the best compromise of efficacy, environmental safety, and economic practicality. The vast majority of vessels are capable of conducting exchange, and the management practice does not require any special structural modification to most of the vessels in operation. Scientific research indicates that offshore ballast exchange typically eliminates 70–95 percent of the organisms originally taken into a tank while at or near port (Zhang and Dickman 1999, Parsons 1998, Cohen 1998). Ballast water exchange, however, is widely considered an interim ballast water management tool because of its variable efficiency, and due to several operational limitations. In the future, a vessel would ideally utilize alternative ship- based or shore-based treatment systems that reduce organisms in ballast water as well as, or better than open-ocean exchange.

Rules Governing Ballast Water Management—The ballast water regulations and guidelines of the nations and U.S. states that regulate ballast water share several similar components. All allow ballast water exchange as an acceptable method of ballast water management, and provide some type of exemption should a vessel or its crew become endangered by the exchange process. All accept approved alternative ballast water treatments in anticipation that an effective technology is developed. All but the International Maritime Organization, require the completion and submission of forms detailing ballast management and discharge practices.

International Regulations—The International Maritime Organization (IMO) adopted the International Convention for the Control and Management of Ships' Ballast Water and Sediments in February of 2004, which becomes effective 1 year after ratification by 30 countries representing 35 percent of the world shipping tonnage (International Maritime Organization). Vessels must conduct exchange at least 50 nm from shore in waters at least 200 meters deep, though it is preferred exchange be conducted 200 nm offshore. Vessels can forgo these exchange requirements if compliance would result in undue delay or deviation from the vessels' intended voyage. In anticipation of the improvement and installation of ballast water treatment systems, the Convention also calls for a gradual phase-out of ballast water exchange. Depending on construction date and ballast water capacity, vessels will instead be expected to meet a ballast water discharge standard according to fixed dates. Finally, a significant provision of the Convention is the provision that recognizes the right of member states to take more stringent measures to prevent NIS introductions. As of spring 2005, the United States has not signed onto the convention.

Canada, Australia, and New Zealand—Canada adopted voluntary guidelines in 2001, and vessels are requested to conduct exchange in waters 200 nm offshore and 2,000 meters or deeper. The ports of Vancouver, Nanaimo, and Fraser River make these voluntary guidelines mandatory, though vessels arriving from Alaska and U.S. West Coast ports north of Cape Mendocino are exempted (Transport Canada 2001). Australia requires ballast water exchange outside of the 12 nm Australian limit in waters greater than 200 m deep, and ballast water from "high-risk" areas are prohibited (Australian Quarantine and Inspection Service). In New Zealand, vessels must conduct mid-ocean exchange in waters at least 200 nm offshore, and must obtain permission before discharging, even if ballast water has been exchanged. Absolutely no discharge is allowed if vessels contain water from the "high-risk" ports of Tazmania and Port Philip Bay, both in Australia (New Zealand Ministry of Fisheries).

Federal Regulations—In September of 2004, the United States Coast Guard adopted mandatory ballast water management regulations for vessels entering from outside the EEZ. Exchange is required to be conducted more than 200 nm offshore, however, vessels that experience undue delay are exempted. There is no management requirement for vessels traveling "coastally," or wholly within the 200 nm EEZ.

Several pieces of Federal legislation that address NIS introductions are currently moving through Congress. One, S. 363, the "Ballast Water Management Act of 2005," addresses the National Invasive Species Act's ballast water management program (16 U.S.C. Section 4711), and would provide a national system for implementing ballast treatment control technologies over time.

Mainland U.S. Pacific Coast—With the exception of Alaska, all U.S. mainland Pacific states have adopted ballast water management regulations that are more comprehensive than the Federal requirements. Oregon began requiring ballast water management in 2002. Vessels of foreign origination are required to conduct exchange at least 200 nm offshore. However, for vessels traveling within 200 nm and entering Oregon from areas north of 50° N, or south of 40° S, a "coastal" exchange of unspecified distance offshore is required (Flynn and Sytsma 2004). Legislation requiring coastal exchange at 50 nm offshore was passed in the Oregon Legislature and goes into effect at the end of 2005. Washington's year 2000-exchange requirement for foreign vessels is identical to Oregon's. Coastally transiting vessels are generally required to conduct exchange at least 50 nm offshore, with the exception that exchange is not required if the water is common to the state, and has not been mixed with waters outside of the Columbia River system (Washington Department of Fish and Wildlife 2003).

California—California's initial legislation, Assembly Bill 703 (AB 703), addressed the ballast water invasion threat at a time when national regulations were not mandatory. The Ballast Water Management for Control of Nonindigenous Species Act, passed in 1999, established a statewide multi-agency program to prevent and control NIS in state waters. In addition to the CSLC, the California Department of Fish and Game (CDFG), the State Water Resources Control Board (SWRCB) and the Board of Equalization (BOE) were charged to direct research, monitoring, policy development, and regulation, and to cooperatively consult with one another to address the problem (Falkner 2003). AB 703 required that vessels entering California from outside the EEZ manage ballast before discharging into state waters. Vessels were required to exchange ballast water 200 nm offshore or treat ballast water with an approved shipboard or shore-based treatment system. There was, however, no management requirement for vessels transiting between ports wholly within the EEZ,

despite evidence that "intra-coastal" transfer may facilitate the spread of NIS from a location where it is firmly established, San Francisco Bay for example, to an adjacent port where it is not (Lavoie *et al.* 1999, Cohen and Carlton 1995). The Legislature, sensitive to the uncertainties surrounding the development of an effective ballast water management program for the State, included a sunset date of January 1, 2004, in AB 703. In 2003, Assembly Bill 433 was passed, reauthorizing and enhancing the 1999 legislation to include many of the recommendations of the program's first biennial report (Falkner 2003).

California's Marine Invasive Species Program

The California Legislature passed Assembly Bill 433 during the 2003 regular session, and was signed by the Governor in October 2003. The bill reauthorized, enhanced, and renamed the State's ballast water management program, creating the Marine Invasive Species Act (Act). The Act applies to all U.S. and foreign vessels, over 300 gross registered tons that arrive at a California port, or place, after operating outside of California waters. All vessels arriving at a California port, or place, must have a ballast water management plan and ballast tank logbook specific to the vessel. Each vessel is required to pay a fee of $500 at its first port call in California. Additionally, each vessel is required to submit a ballast water reporting form upon departure from each port call in California waters detailing their ballast water management practices. However, only vessels arriving from outside the EEZ are required to manage their ballast water as prescribed in the Act. The Act does direct the CSLC to adopt regulations for vessels transiting within the Pacific Coast Region and the rulemaking process currently underway will require coastal exchange at 50 nm offshore for such voyages. The effective date of the regulation is anticipated in late 2005.

In addition to regulatory directives, the Act included mandates to address gaps identified during the beginning years of the program that would improve the ability of the program to prevent NIS introductions. The Commission's Marine Invasive Species Program (MISP) has formed several Technical Advisory Groups (TAG) that discuss policy and regulatory matters related to general NIS management and the implementation of legislative mandates. In January 2000, a general TAG was convened to discuss regulatory matters and continues to meet periodically. In 2005, two specialized advisory group were assembled to formulate recommendations for ballast treatment performance standards and vessel hull fouling. TAGs include representatives from the maritime industry, ports, state agencies, environmental organizations, and research institutions, and serve several critical outreach functions. They serve as a forum through which information and ideas can be exchanged, and ensure that rulemaking decisions consider the best available science as well as the concerns of affected stakeholders. TAG members also relay information to their respective constituencies, keeping them abreast of CSLC actions and activities.

The Marine Facilities Division of the CSLC administers the State's Marine Invasive Species Program (MISP). The MISP staff are active members in several ballast water related groups including: the Ballast Outreach Advisory Team, Sea Grant Extension; Oregon's Ballast Water Management Task Force; Aquatic Nuisance Species Task Force; and the Pacific Ballast Water Working Group. Wherever possible, staff works with the scientific community, other West Coast state representatives, Federal agencies, and the international maritime community to standardize ballast water management programs. This coordination has improved support and compliance by the maritime industry, and has enhanced understanding and the development of solutions to NIS introductions.

The CSLC MISP Inspection Program consists of an extensive monitoring program to ensure compliance and facilitate communication, and is implemented by field offices located in Northern and Southern California. All vessels are required to submit to compliance inspections, which include sample collection of ballast water and sediments, examination of documents, and any additional appropriate inquiries. The Act specifies that inspections be conducted on at least 25 percent of the arriving vessels, with enforcement administered through the imposition of administrative civil and criminal penalties. In addition to verifying compliance with the management requirements of the Act, the Inspection Program plays a key role in outreach and education for the maritime industry.

Assembly Bill 703 created the Exotic Species Control Fund (the Fund) to support each agency's program (Section 71215). All vessels subject to the law are required to submit a fee at its first port call in California. The State's fee-based program has been cited as an important reason for the program's success (Vinograd & Sytsma 2002). Reauthorization of the State's Program under AB 433 included the reauthorization and renaming of the Fund to the Marine Invasive Species Control Fund. The amount of the fee is based on agency budgets approved by the State's Legislature

and totals $16.1 million over 6 years. Budgets cover the CSLC's ballast water inspection and monitoring program, the development and implementation of regulatory packages, research on alternative treatment technologies, hull fouling vectors, and performance standards. The budget also covers the biological surveys conducted by the CDFG to track the extent of NIS introductions in State waters, costs for fee assessment by the BOE, and consultation by SWRCB. CSLC was given the authority to establish the fee amount, up to the maximum of $1,000 per voyage. In January 2000, a TAG was formed, made up of members of the maritime industry and state agencies. The TAG has proved beneficial for determining the appropriate fee amount and for addressing issues related specifically to the implementation of the California Act. The TAG meets regularly to assess the effectiveness of the Program and the status of the Fund. Currently the Fee is $500/voyage, but will be decreased to $400/voyage in mid-2005.

Outreach and Education

Coastal Exchange Stakeholder Workshops—Two stakeholder workshops were held in 2002 and 2003, to address and inform coastal ballast water management in the Western Pacific Coast Region. As a result of these meetings and a subsequent stakeholder meeting in July 2004, CSLC submitted a rulemaking package in April 2005, to the State's Office of Administrative Law, proposing to govern the ballast water management of vessels operating within the Pacific Coast Region.

Outreach to Maritime Industry—One of the key components for the success of the program continues to be the close communication, coordination, and outreach that occurs between the CSLC, the maritime industry, and other state agencies. The CSLC facilitates this communication through several specific avenues including monthly late form notifications, vessel inspections, advisory groups, a website, and through participation in pubic and scientific workshops, and public speaking engagements.

During the first year of the program, a dramatic increase in reporting compliance (submission of ballast water reporting forms) was observed following the initiation of a monthly notification system and issuance of warning letters (Falkner 2003). These activities have subsequently become an integral part of the program. Each month a list of ballast water reporting forms received by the CSLC is reconciled with a list of vessel arrivals reported by the Maritime Exchanges. Qualifying voyages that appear on the Marine Exchanges report, but have not submitted reporting forms to the CSLC are flagged. On or about the fifth of every month, individual agents are then sent a master list of vessels under their purview, indicating which have punctually sent forms and which have not. If a delinquent form is not received within 60 days, a warning letter is sent to the agent. Subsequent enforcement action is taken as necessary.

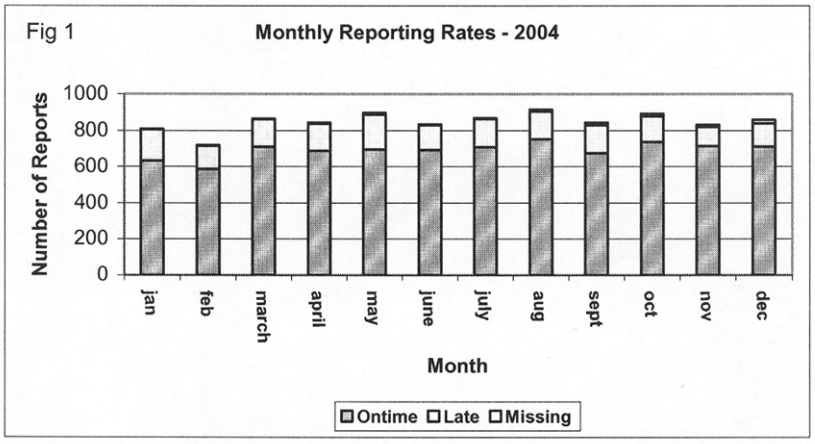
Though this notification process is time intensive, it assures direct, periodic communication with more than 60 shipping agents and has been well received by the maritime industry. Ship owners and agents also contact CSLC personnel directly with questions or concerns. Monthlies and warning notifications have resulted in reporting compliance rates that have increased from ~60 percent in early 2000, to 93 percent by June 2002, to over 98 percent in 2004.

CSLC inspectors serve as an important direct conduit of information to vessel crews, particularly in an industry where vessels often change ownership, routes, and crew composition. During vessel visits, inspectors verbally explain paperwork, reporting, ballast management obligations, and point out where a vessel may be falling short of compliance. For vessels that call at a California port for the first time, inspectors distribute informational packets that include a summary of the California law, instructions on completing the ballast water form, and contacts for more information on West Coast ballast regulations.

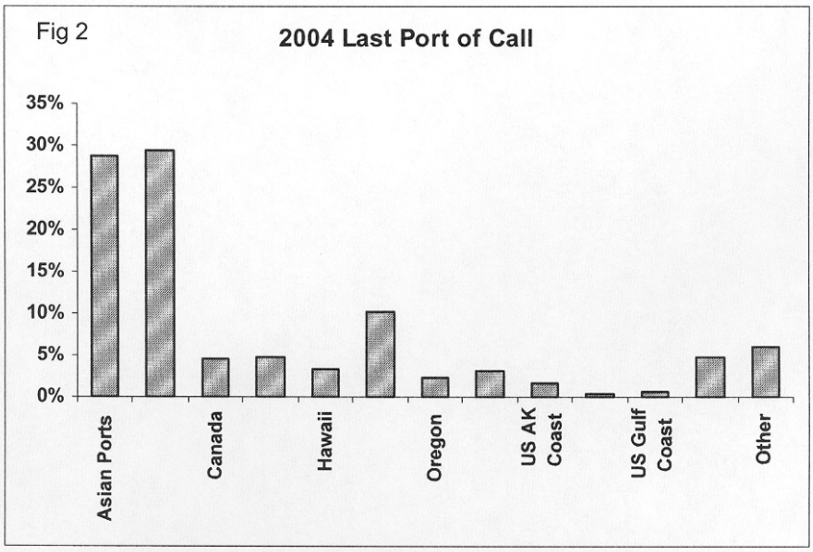
CSLC staff actively continues to facilitate communication among stakeholder groups through several additional vehicles. A website contains programmatic background information, downloadable forms and reports, and rulemaking and public hearing announcements. Attended events have ranged from those sponsored by industry, and by Federal and state organizations. CSLC has also initiated or collaborated on numerous workshops, conferences, and speaking engagements to further enhance outreach efforts.

Compliance—Vessel compliance with the requirement to report ballast management and discharge practices is very high, and has risen dramatically since the inception of the program. In 2003, 97 percent of vessels submitted reports, up from approximately 60 percent observed during the first 6 months of the program in 2000. In 2004, even with the new requirement that voyages between Pacific Coast

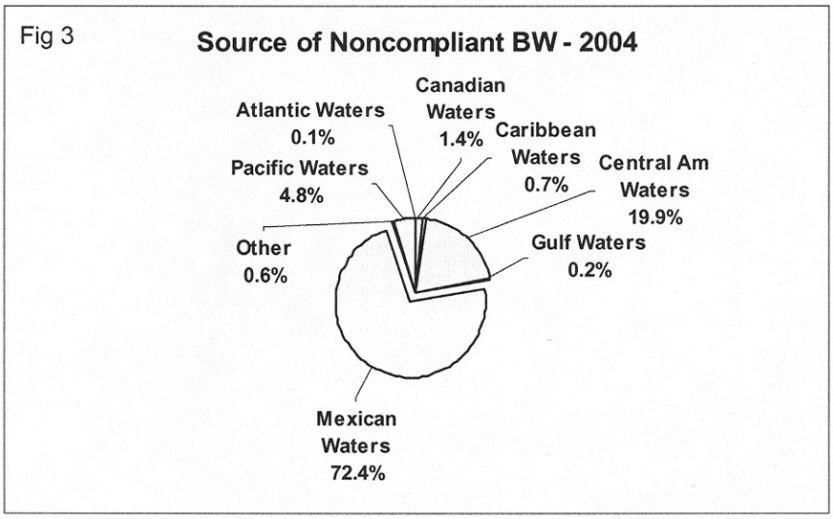
ports, or places, were required to submit reports, compliance exceeded 98 percent, with 82 percent submitting reporting forms on time (Figure 1).



During 2004, all vessels were required to submit a reporting form for each port call in California. The change in QV to include domestic voyages is readily observed in the data. The percentage of arrivals originating from Asian ports dropped from over 50 percent in 2003, to less than 30 percent in 2004 (Figure 2). It also becomes apparent that a large proportion of vessels arrive to California ports from other California ports.



Of the 10,074 reporting forms received for Year 2004, 83 percent retained all ballast water onboard, while 17 percent reported discharges in State waters. Over 95 percent of all ballast water discharged in State waters complied with the law. Of the unexchanged ballast water that was discharged during 2004, the majority originated from coastal Mexican waters (Figure 3). This pattern highlights the need for intense targeted compliance monitoring and enforcement action as necessary by CSLC. Additionally, it reinforces the need for the development of environmentally safe shipboard treatment systems, as well as the identification of alternative exchange zones within coastal waters.



Likewise, vessel-reported compliance with the requirement to manage ballast originating from waters outside the U.S. EEZ continues to exceed 90 percent. In 2004, 7.8 million metric tons of ballast water was reported to have been discharged in state waters, only 4 percent did not comply with the mid-ocean exchange requirements (Table1).

Table 1.—Year 2004 Volume (MT) of Ballast Water Discharged by Port

Port	Compliant (MT)	Not Compliant (MT)	Total Discharged	Compliance (percent)	Non-Compliance (percent)
Avalon	24,123	0	24,123	100	0
Carquinez	469,037	20,893	489,930	96	4
El Segundo	66,212	0	66,212	100	0
Hueneme	7,045	2,587	9,632	73	27
Humboldt	48,699	1,484	50,183	97	3
LA-LB	3,643,580	215,129	3,858,709	94	6
Monterey	6	0	6	100	0
Oakland	424,965	3518	428,483	99	1
Redwood	59,998	20,702	80,700	74	26
Richmond	1,129,114	12,222	1,141,336	99	1
Sacramento	1,028,443	15,804	1,044,247	98	2
San Diego	38,982	3,015	41,997	93	7
San Francisco	317,584	30,489	348,073	91	9
Santa Barbara	23,219	0	23,219	100	0
Stockton	149,398	23,763	173,161	86	14
Statewide Totals	7,430,405	349,606	7,780,011	96	4

Vessel inspections conducted by CSLC staff revealed similarly high compliance rates. During the 2003–2004 period, 2,318 inspections were completed. Less than 5 percent of the noted violations were associated with operational aspects of the law, which includes improper ballast water management (Table 2). In late 2003, CSLC initiated a procedure to ensure that any violations identified during inspections were corrected in advance of the vessel's next visit to California waters. A letter detailing any violations noted during inspections and appropriate corrective action is sent to the registered ship owner. The response from vessel owners has been overwhelmingly positive.

Table 2 Ballast Water Inspections by Port

Port	Year 2003				Year 2004			
	# Inspections	# Violations	# Admin	# Operational	# Inspections	# Violations	# Admin	# Operational
Carquinez	86	6	5	-	134	11	9	2
El Segundo	8	-	-	-	5	-	-	-
Hueneme	28	6	6	-	15	9	9	-
Humboldt	3	-	-	-	4	-	-	-
LA-LB	558	141	135	6	682	219	207	12
Oakland	137	3	3	-	265	32	32	-
Redwood	13	1	1	-	17	2	1	1
Richmond	41	2	1	1	127	9	7	2
Sacramento	10	-	-	-	12	3	3	-
San Diego	42	-	-	-	33	-	-	-
San Francisco	20	-	-	-	20	7	7	-
Stockton	16	-	-	-	42	10	9	1
Total	**962**	**159**	**151**	**7**	**1356**	**302**	**284**	**18**

The high compliance rates observed in the California Program are attributable to the multi-pronged outreach and communication activities undertaken by the CSLC. Inspectors distribute information verbally and in print to crews on regulations. Agents are notified monthly of their vessels' reporting compliance or non-compliance. Multi-agency, multi-interest advisory groups are continually convened and consulted regarding evolving policy considerations. These efforts serve to maintain well-informed stakeholders, build working relationships with affected parties, and ensure that regulations are wisely developed.

Fee Submission—While the CSLC has authority to establish the fee amount; assessment of the fee is the responsibility of BOE. The BOE receives daily reports from the Los Angeles/Long Beach Marine Exchange listing actual arrivals from the following ports: Los Angeles/Long Beach, Port Hueneme, San Diego, and El Segundo. In addition, the Board receives two daily reports from the San Francisco Marine Exchange. An electronic and paper record of this information is maintained for reference and use by the BOE staff. The reports are reviewed to determine which arrivals are qualifying voyages and thus subject to the fee. In 2001, a return (self-reporting) process was initiated by BOE to reduce the overall number of billings, though not the amount of revenue collected. With the assistance of industry representatives, a return form was developed allowing the larger owner/operator/agents to self-report their vessel voyages.

There are currently 2,508 ballast accounts representing 6,449 vessels registered with the BOE. On average, 120 new Ballast Registrations are added per month. In addition, an average of 115 account maintenance items (address changes, adding vessels to existing accounts, *etc.*) are processed per month. An average of 25 ballast accounts are closed out each month, and an average of 470 ballast water billings are mailed per month. Compliance rate for fee submission exceeds 98 percent.

Collaborative Projects/Research/Technology Development

Treatment Technologies—Though ballast water exchange is by far the most widely used ballast water management tool, the eventual goal is to manage ballast water through ship-based or shore-based treatment systems. Ballast exchange can expose vessels to some risk and may delay voyages. As described above, exchange can expose vessels to some risk and may delay voyages. The efficiency of exchange is also quite variable, and can depend on a vessel's configuration or age. Though no alternative treatment technologies are available for widespread installation, several promising enterprises are under development.

The Ballast Water Management Act of 1999, directed CSLC to evaluate and approve alternative treatment technologies designed to remove and/or inactivate organisms in ballast water. The Marine Invasive Species Act of 2003, authorized the CSLC to sponsor a pilot program for the purpose of evaluating alternatives for treating and otherwise managing ballast water, and also authorizes the CSLC to sponsor other research related to the transport and release of non-indigenous species into California waters.

CSLC staff collaborates with other agencies and organizations to identify alternative methods for ballast water management. In the past 18 months, the CSLC has reviewed and considered for funding two alternative treatment technologies. The Venturi Oxygen Stripping System and the Ecochlor Ballast Water Treatment System have each shown, through initial studies that shipboard applications may be effective. Further research is needed, and CSLC will be funding at least one, possibly both of these proposed projects.

West Coast Ballast Water Demonstration Project—In August 2000, the California State Lands Commission was awarded a $150,000 grant from the U.S. Fish and Wildlife Service (USFWS) to implement the West Coast Regional Applied Ballast Management Research and Demonstration Project (West Coast Demonstration Project). The West Coast Demonstration Project was an inter-agency pilot project to acquire and distribute information regarding applied alternatives for ballast water management. In December 2000, the Port of Oakland agreed to match the USFWS funds, doubling the funds available for this project, making it possible to evaluate the efficacy of treatment systems onboard at least two vessels. The SWRCB received $150,000 from the Exotic Species Control Fund to evaluate alternatives for treating and managing ballast water. Total funding provided by the USFWS, SWRCB and the Port of Oakland for the West Coast Demonstration Project combined to a total of $450,000.

Ballast Water Exchange Verification—In October 2003, the Commission, acting as Trustee for the Kapiloff Land Bank Fund (the Fund), accepted funds in the amount of $200,000 from Carnival Cruise Lines, a division of Carnival Corporation, and deposited in the Fund as settlement for certain questions regarding compliance with ballast water management requirements under Public Resources Code Sections 71200 *et seq*. These funds were designated for projects relating to ballast water management under Public Resources Code Section 71200 through 71271 and successor statutes.

Utilizing the aforementioned Kapiloff Land Bank Funds, CSLC has entered into an agreement with the Smithsonian Environmental Research Center (SERC) to test explicitly the application of Ballast Water Exchange verification (BWEv) methodology on vessel traffic arriving to ports along western North America. In previous experiments, the BWEv methodology showed strong potential for discriminating between near coastal or port water. A refined methodology could therefore be used to develop a rigorous test for discerning exchanged ballast water from unexchanged ballast water on a vessel. The proposed research is intended to "demonstrate" the application of the BWEv methodology to a specific region, as well as expand the overall scope of our ongoing analyses and possible application on a global basis. This work builds upon significant national and international efforts to implement a reliable, affordable, and easy-to-use method for BWEv. The CSLC–SERC project will begin June 2005 and June 2007. Sampling events will be scheduled to occur on a quarterly basis, beginning in June 2005.

Hull Fouling—With funding from the MISP, the Aquatic Bioinvasion Research and Policy Institute (ABRPI), which combine the SERC's marine expertise and Portland State University's freshwater expertise, will conduct a study to examine the potential for invasions to California through the fouling vector. Using data on vessel dimensions and arrivals, SERC will estimate the total vessel surface area on a variety of vessel types that: (1) Arrive to port systems in California, Oregon, and Washington, and (2) Have the potential to be colonized by fouling organisms. The study will also include a pilot project that will utilize Remotely Operated Vehicle (ROV) collected videos, still images, and diver collected samples to estimate the amount and types of organisms attached to exposed surfaces. These complimentary analyses will move toward creating a broad understanding of the overall risk fouling poses for NIS introductions to California. The CSLC–ABRPI project will begin June 2005 and conclude July 2007.

Summary of Other Research

In addition to research fully or partially funded by CSLC, two studies highly relevant to the prevention and management of NIS in California have been funded or directed by CSLC collaborators. Both were extensive, multi-agency, multi-institution enterprises, for which the MISP provided some assistance with logistics or document review. The first was a three part study on local container vessels, funded by the Port of Oakland, evaluating the effectiveness of ballast exchange for removing planktonic organisms, and examining the biota that arrive to the port in ballast tanks and in fouling communities. The second, directed by the California Department of Fish and Game, sought to characterize the distribution of estuarine and coastal invasives in California.

CDFG Invasive Species Survey—Under the 1999 legislation, the California Department of Fish and Game (CDFG) was the primary agency required to conduct a study to determine the location and geographic range of non-indigenous species in California estuaries and coastal areas. The study focused on areas where introduced species from ballast were most likely to occur. Biological sampling took place for infaunal and epifaunal areas, as well as for fish and plankton. Biological data collected during this study will provide the basis for a more comprehensive analysis

of impacts from non-indigenous species and will serve as a baseline to determine effectiveness of future management efforts to control species introductions.

Moving Forward

Improving Compliance—Although California's Program continues to be very successful, resulting in high compliance with all requirements of the Act; data indicate a persistent yet small percent of vessels violating the ballast water management mandates. Specifically, those vessels arriving from Mexican, Central and South American ports account for 85 percent of the volume of ballast water discharged that does not comply with the law. Further analysis shows that many of these vessels are conducting some form of an exchange, but not to the prescribed legal standards set in the Act (*i.e.,* exchange at >200 nm from land). Because of this analysis, CSLC has refocused the intensive compliance monitoring of reporting forms, the education and outreach to vessels owner/operators and as necessary pursue enforcement actions on offending vessels. Additionally, CSLC continues to aggressively explore and support research addressing shipboard treatment technologies and alternative exchange zones within coastal waters.

Regulations Governing Coastal Voyages—Current California law requires that vessels originating from places outside of the EEZ manage ballast water, however, there is no ballast management requirement for vessels that arrive to California ports from places within the EEZ. The transfer of NIS from an invaded port to an adjacent port poses a significant risk for introducing and spreading species throughout a region (Lavoie *et al.* 1999, Cohen and Carlton 1995). On the West Coast in particular, a highly invaded area, such as the San Francisco Bay, can serve as a hub for NIS to spread to other Pacific Coast Region ports, such as Los Angeles or Portland. In recognition of this vulnerability, the Marine Invasive Species Act of 2004, directs the CSLC to adopt ballast management regulations for transits between ports within the Pacific Coast Region, defined as the region 200 nm offshore, from 154 degrees W longitude and north of 25 degrees N latitude, exclusive of the Gulf of California.

Based on recommendations from the two Coastal Exchange workshops, the CSLC Technical Advisory Group came to the consensus for ballast water exchange at least 50 nm offshore for voyages within the Pacific Coast Region. The 50 nm limit incorporated several key issues of concern. Although ballast water exchange at distances more than 200 nm offshore is considered the most biologically prudent, vessels traveling within the Pacific Coast Region could be diverted more than 100 nm offshore from their normal route. For most voyages, the 50 nm distance would require no course deviation for some vessels and a minor deviation for many. Exchange at 50 nm avoids ballast discharge in coastal "retention zones" and at the mouths of estuaries, where currents and tides can carry organisms to shore or sweep them into bays and estuaries. The limit also lies beyond the boundaries of sensitive protected areas, such as National Marine Sanctuaries. Further, the maritime industry requested that California's regulation be consistent with other U.S. state, Federal and international regulations, in order to avoid confusion that would occur should vessels encounter a patchwork of varying regulations as they traveled across jurisdictions. The 50 nautical mile limit addressed this request, as Washington and the International Maritime Organization have similar requirements, and Oregon has adopted legislation that mandates the same.

An exemption was included for voyages between ports within the San Francisco Bay/Delta region, and for voyages within the Los Angeles/Long Beach/El Segundo Port Complex. In the absence of such a designation, the 50 nm requirement would pose an operational and economic burden for vessels transiting between ports contained within a single port region. Scientific experts consulted agreed that, biologically, the designation was reasonable given the current knowledge of NIS dispersal within an estuary, and given the logistical realities of vessel voyage patterns (Cohen pers com., Crooks pers com., Kimmerer pers com., Weisberg pers com.)

Rulemaking documents for the regulation were submitted to the Office of Administrative Law in April 2005, and the Notice of Proposed Rulemaking was published April 15, 2005. Following public hearings and consideration of public comments, the final regulation is anticipated to be approved in June 2005, with an implementation date in late 2005.

The Commission staff held two public hearings. The first on June 2, 2005, in southern California, and the second on June 8, 2005, in Northern California. For the vast majority of commercial vessels that fall under this regulation, near-coastal ballast exchange will be the primary method of ballast water management. Currently, it is the best compromise of efficacy, environmental safety, and economically practicality. According to industry representatives, the vast majority of vessels are

capable of conducting exchange, and the management practice does not require any special structural modification to most of the vessels in operation.

The shipping industry has expressed concern that a small minority of vessels and/or commercial shipping routes may be significantly impacted by the proposed regulations. Commission staff recognizes this possibility. These vessels and/or commercial shipping routes can be categorized in two ways. The first are vessels that, due to special safety circumstances, are unable to perform ballast water management as described in the proposed regulation. For example, ballast water exchange as outlined in the regulations may pose a serious personnel safety concern for tugs and barges. Safely moving a crew from a small boat to a barge could pose a serious safety risk. To address this issue, a provision is included in the regulation, ensuring that the safety of the vessel, its crew, or its passengers is not compromised by the management requirements specified in the regulation.

The second general concern relates to a minority of vessels, for which compliance with the proposed ballast water management requirements may present some hardship not related to safety. To address this issue, a petition process has been included in the rulemaking package that would allow impacted entities to present individual hardship cases and associated alternative ballast management proposals to the Commission. This section is necessary to provide flexibility for the Commission to consider special hardship cases from the maritime industry, and associated alternative management proposals, on a case-by-case basis, while providing a formal public notification and/or review process.

A broader concern, related to the "shared water" designation, was expressed by the industry. It has been suggested that the proposed regulations should include geographically-extensive, shared-water designations similar to those used in Oregon and Washington. For example, for transits between Los Angeles and San Diego, and for voyages between the San Francisco Bay-Delta to Eureka, the industry has requested various relaxations to the requirement for exchanging ballast at locations 50 nm offshore and 200 m depth.

In consideration of these concerns, staff subsequently contacted several scientific experts, reviewed relevant scientific literature, and completed preliminary analyses to address the issue. In summary, the best available information strongly indicates that estuarine (bay/port) ballast water should not be transported between California ports, and this includes voyages between the specifically mentioned short-haul voyages.

- Natural transport of organisms between estuaries appears to be very low, in the absence of human activity.
- Short coastal voyages are more likely to transport organisms in good physical condition, maximizing chance for establishment in a new area.
- The San Francisco Bay estuary is one of the most highly invaded areas of the world, and is likely to act as a "hub" from which non-indigenous species can spread to other areas of California.
- Many non-indigenous organisms found in one of the aforementioned ports are not yet found in the other. The potential for their continued spread should be minimized.
- Some non-indigenous species in San Francisco Bay are clearly problematic or are found in very high numbers, and have not yet been found in Humboldt Bay (Table 3). Examples include the Chinese mitten crab and the Asian clam.
- The region between San Diego and Point Conception is an oceanographic "retention zone" where water re-circulates for extended periods. These zones have the capacity to retain organisms released in them, and oceanographers have explicitly recommended avoiding ballast exchange in them.

Finally, several commenters suggested the inclusion of language stating that a vessel should not be required to deviate from its intended voyage or unduly delay its voyage to comply with ballast water management requirements. Without further contingencies and definition, a small deviation or minor delay in an intended voyage could easily be claimed, exempting those voyages and significantly weakening the ability of this regulation to effectively prevent or minimize the introduction and spread of NIS. Furthermore, the inclusion of this language puts the decision to comply in the hands of the regulated community, not the regulatory agency. Additionally, it is believed that without sufficient definition, this language would not meet the "Clarity Standard" required in the California Administrative Procedures Act. As an alternative, staff has included a petition process that would allow impacted entities to present individual hardship cases and associated alternative ballast management proposals to the Commission.

Performance Standards Advisory Panel Description—The CSLC is required, in consultation with SWRCB, and in consideration of the advisory panel (Panel), to submit to the legislature a report that recommends specific performance standards for the discharge of ballast water into the waters of the state. The performance standards will be based on best available technology economically achievable, and be designed to protect the beneficial uses of state waters.

In late 2004, the CSLC invited participation from the stakeholder community to develop recommendations for performance standards. The Panel was first convened early in 2005, with meeting dates scheduled through June 2005. The Panel includes participants from the SWRCB, the Regional Water Quality Control Board, the CDFG, and the U.S. Fish and Wildlife Service, as well as representation from University experts, research groups, shipping agencies, ports, and environmental organizations.

Issues identified thus far include appropriate regulatory monitoring methods and impacts to coastal voyages versus oceanic voyages. Documents for review include, but are not limited to, publications on biological criteria, engineering feasibility, physical/biological/chemical characteristics of fresh and saline water, efficacy of reducing viable organisms under vessel operating conditions, economic costs of installation and operation of equipment, appropriate parameters for measuring treatment efficacy, and/or appropriate experimental designs for efficacy tests.

The Panel has spent significant time evaluating the discharge standards adopted by the IMO Convention to assess it potential effectiveness at preventing or reducing NIS introductions from ships' ballast water and the discharge standard proposed in U.S. legislation (*e.g.,* S. 363—The Ballast Water Management Act of 2005).

The IMO Convention calls for ships to meet a ballast water discharge standard according to a schedule of fixed dates. While the IMO Convention is an important step forward in the effort to combat NIS introduced by ships' ballast water, the standard adopted represented only a slight decrease in the concentration of zooplankton and no reduction of phytoplankton from the observed median value for unmanaged ballast water, allowing 1,000 organisms of the same size in 100 cubic meters. An analysis by the International Council for Exploration of the Seas of known concentrations of organisms in ballast tanks observed the median concentration for zooplankton was $400/m^3$ and the observed mean concentration for phytoplankton was 13.3/ml. This same group recommended a three orders of magnitude reduction below the observed median concentration for zooplankton, and an equivalent or higher level of reduction for phytoplankton. The IMO Convention standard represents only a 1-order magnitude reduction in concentration of zooplankton from the median observed values for unmanaged ballast and no reduction of phytoplankton from the observed median value for unmanaged ballast. Fortunately, the IMO Convention explicitly recognizes the right of a party to take more stringent measures to prevent NIS introductions. The Ballast Water Management Act of 2005 (S. 363), contains many of the provisions of the IMO Convention, however the concentration-based standard is 100 times more stringent than that found in the IMO Convention.

Panel recommendations will be provided to CSLC staff on or before July 1, 2005. CSLC is required to submit to the legislature, a final report including recommendations for performance standards by January 31, 2006.

Non-Ballast, Ship-Mediated Invasion Vectors—The Act directs the CSLC, in consultation with a technical advisory group, to analyze the risk of invasion though fouling on commercial vessels, and present management recommendations to prevent such introductions. The legislation further specifies that the advisory group will include (but may not be limited to) representatives from the shipping and port communities, the USCG, state resource agencies, Federal resource agencies, and the scientific research community.

A jointly administered workshop with California Sea Grant Extension on vessel hull fouling was held in May 2005. The workshop examined management perspectives and experiences from other states and countries (Hawaii, New Zealand), the risks and impacts from hull-born invasives to the West Coast, and options for prevention and management. Attendees represented the commercial shipping and recreational boating communities, ports, vessel cleaning technology groups, state and Federal resource agencies, environmental organizations, and scientific experts. CSLC staff is currently summarizing the results from that workshop.

The CSLC will hold two additional advisory meetings with a subset of the workshop attendees. These meetings are planned for September and December 2005, and will serve to solidify findings and recommendations with regard to commercial vessels. The final report will be completed for the state legislature and public by March 1, 2006. As mentioned previously, CSLC will be funding the Aquatic Bioinvasion Research and Policy Institute (ABRPI) to conduct a study examining the potential for

invasions to California through the fouling vector. The CSLC–ABRPI project will begin June 15, 2005 and concludes July 31, 2007.

Needed Research

Ballast Water Treatment Technology Development—Efforts to identify effective treatment technologies continue to progress slowly. The effort to develop effective technologies should be one of integrated phases, including R&D on basic and innovative technologies, prototype development, shipboard applications, and certification and implementation. CSLC continues its relationship with the USCG, National Oceanic and Atmospheric Administration (NOAA), and SERC to ensure continuity at the state, national, and international level.

Standardized Analysis of Shipboard Treatment Technologies—Evaluating the performance of ballast water treatment technologies onboard ships, under realistic operational conditions, is a requirement of most ballast water management programs. The evaluation of treatment systems is difficult and costly.

Various approaches have been proposed making comparisons across technologies and even within the same technology difficult. The lack of standardization creates significant confusion about the criteria needed for evaluation and approaches to be used to determine compliance, allowing official approval for particular treatment systems. The USCG, Aquatic Bioinvasion Research and Policy Institute, and Pacific States Marine Fisheries Commission, and CSLC are involved in the formative stages of this issue. CSLC continues its relationship with these entities to ensure continuity at the state, national, and international level.

Conclusions

Due to continued and expanded intensive outreach by CSLC staff, the utilization of technical advisory groups and a monthly electronic notification system, along with daily interactions with maritime industry, and the potential for civil and criminal penalty action, compliance with the California Act has continued to improve (>95 percent). The Program's success and the relatively weak Federal program, supports the continuation of the California Marine Invasive Species Program.

CSLC has worked to coordinate with other states and the Federal Government on ballast water and hull fouling management issues. Wherever possible, California works with the scientific community, other West Coast states, the Federal Government, and the international community to standardize ballast water and hull fouling management programs. This coordination has resulted in improved support and compliance by the maritime industry and has enhanced the understanding and development of solutions to NIS introductions.

As discussed above, there is a significant amount of momentum in the Pacific Coast Region to prevent the introduction NIS. The existing framework in California has taken many years of stakeholder collaboration. The continued and increasing level of compliance within California's Marine Invasive Species Program reinforces stakeholder approval.

As Federal regulations are developed, the legislature should strongly consider the continued success of California's Marine Invasive Species Program. California not only exemplifies the potential of state programs, but will compliment and reinforce Federal regulations for ballast water management. Preemption provisions may be beneficial in specific areas such as performance standards for the treatment of ballast water; however, broad preemption language for state programs would be detrimental to the overall goal of controlling NIS introductions via commercial shipping in the United States.

The control of NIS via commercial shipping is a highly complex process requiring not only outreach and education in the maritime community, but most of all, regulatory consistency. Among other state programs, California has worked hard to establish a framework for the proper management of ballast water. The existing regulatory framework in California can be modified in conjunction with Federal regulations, which could provide an excellent foundation for the implementation of Federal rules.

References Cited

Apte, S.M., B.S. Holland, S.L. Godwin, and J.P.A. Gardner. 2000. Jumping ship: A Stepping Stone Event Mediating Transfer of a Non-indigenous Species via a Potentially Unsuitable Environment. *Biological Invasions.* 2 (75–79).

Australian Quarantine and Inspection Service. "Australian Ballast Water Management Requirement". *Marine Awareness Kit.* Accessed 24 March 2005. Website: *http://www.affa.gov.au/corporate_docs/publications/html/quarantine/ballast_water/Australian_BW_Requirements.pdf.*

Carlton, J.T. 1999. The scale and ecological consequences of biological invasions in the world's oceans. *In* Invasive Species and Biodiversity Management. O.

Sandulund, P. Schei, and A. Viken, Eds. Kulwer Academic Publishers. Dordrecht, Netherlands. 195–212 pp.
Carlton, J.T. 2001. Introduced Species in U.S. coastal waters: Environmental impacts and Management Priorities. Pew Oceans Commission. Arlington, VA. 28 pp.
Cohen, A.N. 1998. Ships' Ballast Water and the Introduction of Exotic Organisms into the San Francisco Estuary. Current status of the problem and options for management. San Francisco Estuary Institute, Richmond, CA. 81 pp.
Cohen, A.N. (personal communication, 12/13/2004).
Cohen, A.N. and T.J. Carlton. 1998. Accelerating invasion rate in a highly invaded estuary. Science. 279 (555–558).
Coutts, D.M., K.M. Moore, and C. Hewitt. 2003. Ships' sea-chests: An overlooked transfer mechanism for non-indigenous marine species? Marine Pollution Bulletin. 46 (1504–1515).
Crooks, J. (personal communication, 12/14/2004).
Falkner, M.B. 2003. Report on the California Ballast Water Management Program. California State Lands Commission, Marine Facilities Division. 82 pp.
Fofonoff, P.W., G.M. Ruiz, B. Steves, and J. Carlton. 2003. In ships or on ships? Mechanisms of transfer and invasion for nonnative species to the coasts of North America. Pp. 152–181. *In* Invasive species, vectors and management strategies. G.M. Ruiz and J.T. Carlton Eds. Island Press, Washington, D.C.
Godwin, S.L. 2003. Hull fouling of maritime vessels as a pathway for marine species invasions to the Hawaiian Islands. Biofouling. 19 (123–131).
Godwin, S.L., L.G. Eldredge, and K. Gaut. 2004. The assessment of hull fouling as a mechanism for the introduction and dispersal of marine alien species in the main Hawaiian Islands. Bishop Museum Technical Report No. 28. Honolulu, HI. 114 pp.
Grosholz, E.D. and G.M. Ruiz. 1995. Spread and potential impact of the recently introduced European green crab, *Carcinus maenas,* in central California. Marine Biology. 122(2):239–247.
Hallegraeff, G.M. 1998. Transport of toxic dinoflagellates via ships' ballast water: Bioeconomic risk assessment and efficacy of possible ballast water management strategies. Marine Ecology Progress Series. 168 (297–309).
International Maritime Organization. *Global Ballast Water Management Program—The New Convention.* Accessed 3/25/2005. Website: *http://globallast.imo.org/index.asp*.
Kimmerer, W. (personal communication, 12/15/2004).
Lovell, S.J. and S.F. Stone. 2005. The economic impacts of aquatic invasive species: A review of the literature. Working Paper No. 05–02. U.S. Environmental Protection Agency. Washington, D.C. 64 pp.
Minchin, D., and S. Gollasch. 2003. Fouling and ships' hulls: How changing circumstances and spawning events may result in the spread of exotic species. Biofouling. 19 (111–122).
National Research Council. 1996. Stemming the Tide: Controlling Introductions of Nonindigenous species by ship's ballast water. National Academy Press, Washington, D.C. 141 pp.
New Zealand Ministry of Fisheries. A guide to New Zealand ballast water controls. Accessed 24 March 2005. Website: *http://www.fish.govt.nz/sustainability/biosecurity/ballastwater.html*.
Nichols, F.H., J.K. Thompson, and L.E. Schemel. 1990. Remarkable invasion of San Francisco Bay (California, USA) by the Asian clam *Pomtamocorbula amurensis*. II. Displacement of a former community. Marine Ecology Progress Series. 66 (95–101).
Parsons, M.G. 1998. Flow-through ballast water exchange. *Society of Naval Architects and Marine Engineers*, Transactions. 106 (485–493).
Pimentel, D., R. Zuniga, and D. Morrison. 2004. Update on the environmental and economic costs associated with alien-invasive species in the United States. Ecological Economics. *In Press*.
Phyre Technologies Inc. March 2005. Proposal Number: N051–039–1267. Topic Number: N05–039. Draft Proposal for the California State Lands Commission.
Rudnick, D.A., K.M. Halat, and V.H. Resh. 2000. Distribution, Ecology and Potential Impacts of the Chinese Mitten Crab (*Eriocheir sinensis*) in San Francisco Bay. University of California Water Resources Center. Riverside, CA. Contribution No. 206. 74 pp.
Ruiz, G.M., P.W. Fofonoff, J.T. Carlton, M.J. Wonham, and A.H. Hines. 2000a. Invasion of coastal marine communities in North America: Apparent patterns, processes, and biases. Annual Review of Ecology and Systematics. 31 (481–531).

Ruiz, G.M., T.K. Rawlings, F.C. Dobbs, L.A. Drake, T. Mullady, S. Schoenfeld, A. Hug, and R.R. Colwell. 2000b. Global spread of microorganisms by ships. Nature. 408 (49–50).
Ruiz, G.M. and T.J. Carlton. 2003. Invasion vectors: A conceptual framework for management. *In* Invasive species, vectors and management strategies. pp. 459–498. G.M. Ruiz and J.T. Carlton Eds. Island Press, Washington D.C.
Transport Canada. 2001. Guidelines for the control of ballast water discharge from ships in waters under Canadian Jurisdiction. Accessed 24 March 2005. Website: *http://www.tc.gc.ca/marinesafety/TP/Tp13617/Tp13617Erev1.pdf.*
U.S. Commission on Ocean Policy. 2004. An Ocean Blueprint for the 21st Century. Final Report. Washington, D.C. 520 pp.
Vinograd, J. and M. Sytsma. December 2002. Draft Report on the Oregon Ballast Water Management Program in 2002. Center for Lakes and Reservoirs. Portland State University.
Washington Department of Fish and Wildlife. 2003. *Washington state ballast water program.* Accessed 25 March 2005. Website: *http://www.wdfw.wa.gov/fish/nuisance/ballast.htm*.
Weisberg, S. (personal communication, 12/14/2004).
Zhang, F. and M. Dickman. 1999. Mid-Ocean exchange of container vessel ballast water. 1: Seasonal factors affecting the transport of harmful diatoms and dinoflagellates. Marine Ecology Progress Series. 176 (243–251).

The CHAIRMAN. Thank you very much, Ms. Falkner. We'll begin the questioning with Senator Boxer.

Senator BOXER. Thank you so much, Mr. Chairman. I have a number of questions, but due to the time constraints I would like to submit them to our panel for the record. I do have one or two that I'd like to do now—if that is all right with you?

The CHAIRMAN. You have a full 5 minutes. We gave all of these witnesses at least 5 minutes.

Senator BOXER. That is very kind of you.

The CHAIRMAN. I wouldn't be doing my job if I didn't give you at least the same time.

Senator BOXER. I appreciate that. And I hope this banter does not take time off of my——

[Laughter.]

Senator BOXER. Mr. Chairman, I want to thank you. This has been a terrific panel in terms of learning about the new technologies, where the Commerce people have their red flags up and scientists are going, our Coast Guard and, of course, our state people who are, I wouldn't say on the ground, but really on the water here. So here's the thing, I was telling the Chairman, I didn't get a chance to read this in my statement, but, you know, I want to ask Ms. Falkner, if this is her understanding, my staff tells me that more than 175 invasive species threaten to overwhelm native fish and other wildlife in the San Francisco Bay alone. Is that your understanding?

Ms. FALKNER. Based on the data that has been collected by the Department of Fish and Game as well as others, there are over 175 non-indigenous species that are pretty much unique to the bay that have not been found in other embayments in California or the West Coast.

Senator BOXER. And my understanding is that nationally, Mr. Chairman, the damage, the economic damage of invasive species throughout the whole country is $137 billion a year. I mean, this is extraordinary, if this is true, and that's why, Senator Inouye, I'm so grateful to you for your bill on this particular matter. We cannot turn away from this. This doesn't make any sense. We need to do

something. So just for the record, Ms. Falkner and Ms. Hum, maybe, because in your states you see this, what's the type of damage that we're already seeing here and what can we expect if we do nothing about this problem?

Ms. FALKNER. The type of damage in the bay area has included, for example, the Chinese mitten crab shut down the water municipalities for several days in September 1998. That impacted the coho salmon run occurring at that time, it impacted the agricultural and municipal water users. I also found out that these organisms burrow into the levy, so they are substantially potentially weakening the levy system throughout the Bay delta. It's very hard to estimate or to calculate, determine which organisms are going to be problematic and which are not, but there is a long laundry list of organisms and the cost involved in controlling them. Basically, once they're established, they're our "friends."

Senator BOXER. Ms. Hum?

Ms. HUM. In Hawaii, our work has been focused on alien algae, an invasive species, and the primary troubles caused by alien algae are habitat destruction, and that's been part of what has led to the decline in our near-shore fisheries. So, again, 75 percent decline in near-shore fisheries, in part because of habitat destruction caused by invasive species.

Senator BOXER. Seventy-five percent species decline. That's incredible.

Ms. HUM. Decline in near-shore fisheries.

Senator BOXER. I'm going to just submit the rest of my questions for record. But, again, I want to thank you all and we are hopeful we can see some action.

The CHAIRMAN. Thank you very much, Senator Boxer. Senator Inouye.

Senator INOUYE. Thank you very much. Mr. Mandelman, your technology seems very simple and up-front. What's the cost estimate?

Mr. MANDELMAN. The cost estimate, and I want to emphasize at this point we're still dealing with prototypes, the equipment that will be installed this September on the *Prince William Sound,* which is a 140,000-ton oil tanker, is approximately three-quarters of a million dollars. Now, this is a prototype system. It has been custom designed. We strongly expect that once this goes into full scale production that the cost of building it will drop significantly once it's coming off a production line. Ultimately, this will be production-line technology. So we could see another 20 percent decrease.

The second part, to answer your question fully, unlike the original equipment that we installed on the *Tonsina,* this work on the *Prince William Sound* will be done with a riding crew. The ship will not have to go into dry dock. Much of the work—not all of it, but much of it can be done while the ship is in actual operation except for the time when they're doing some welding. So, a ship doesn't have to be taken out of service for more than a couple of days at most so the financial cost to the ship owner of having to take the ship out of service is reduced to almost nothing. It's not zero, but it would be very low. We expect that most ships could be outfitted for under half a million dollars.

Senator INOUYE. The standards of the IMO, as set forth by Ms. Metcalf have five criteria. Will your device meet those needs?

Mr. MANDELMAN. We think it meets all of them without any problem.

Senator INOUYE. You think it will?

Mr. MANDELMAN. I think it will meet all of the IMO criteria. It's safe, it's affordable, it's easily installed—it will meet the standards, I think there won't be any difficulty with that at all.

Senator INOUYE. What are your thoughts, Ms. Metcalf?

Ms. METCALF. I'm an optimist, Senator, so I'd like to jump up and agree with Mr. Mandelman and from what we have been told through the tests on the *Tonsina* and the *Prince William Sound,* studies that will be coming up, I see very little problem with four of the five, but I've not yet seen—and what I might add, I have not yet seen from any of the other technologies that have been tested, is peer-reviewed data which shows the achievement of the 10 organisms per-unit-volume above and below 50 microns. The biological effectiveness is still a question, and if I might add, next month at the International Maritime Organization, the Marine Environment Protection Committee will be conducting their pre-review process, which is their reality check, that's required 3 years prior to the first implementation date in 2009. So far the papers that I have seen submitted are woefully inadequate in proving that technology is now available. That is not to say that it won't be available in 2009, but the data we've seen thus far is not one that let's me go to sleep easily in the evening.

Senator INOUYE. Admiral, the principal agency to monitor these bills if they become law is the Coast Guard. Do you have sufficient personnel and equipment?

Admiral GILMOUR. Sir, we certainly have sufficient personnel to successfully carry out the ballast water management program we have now. I think in the area of where we go with it, with a discharge standard which we do think is important, we're also going to have to develop the technology to measure the effectiveness which is one of the things I talked about in my statement. And I think some of what was said that we'll come up with different means to measure that technology, whether it be chemical, ozone, or other types of systems. So I hope that when we come up with a way to verify the effectiveness it will not have a significant additional workload on our personnel. We're looking for technology solution in that area. Right now we're going to have people looking at all ballast water management that comes into the U.S., so we can do that through our port state control program, yes, sir.

Senator INOUYE. What about NOAA? Do you have enough personnel and equipment?

Mr. KEENEY. Senator, we did not request specific funding in the budget for 2006 for ballast water, however, we do have several programs that I mentioned in my testimony, including Great Lakes Environmental Research Laboratory and Sea Grant that do work on ballast water on discretionary basis, so we believe we do have sufficient funds.

Senator INOUYE. I'm very happy with the work that Ms. Hum is doing in Hawaii. It is a program that I think should be looked into by all communities. So, congratulations.

Ms. HUM. Thank you, Senator, very much.

Senator INOUYE. But I'm concerned about costs. In the last 5 years we have spent $121 billion for space exploration, and for all ocean programs we have spent $34 billion. Of that $34 billion, $30 million were spent on ocean exploration. That's the difference. $121 billion for space exploration, but only $30 million for ocean exploration, even though the ocean covers 70 percent of the planet's surface. Somewhere we have missed priorities. I hope that the measures that we have submitted will do something, but without adequate funding I don't know how far we'll get. But I'm concerned about the cost of equipment because only 4 percent of American bottoms carry international trade goods, 96 percent are foreign bottoms, and if we add costs for construction and equipment it might be less, and I'm concerned about that. So you think you'll come down from the prototype's half a million?

Mr. MANDELMAN. Yes. Yes, we do, and something that Ms. Metcalf mentioned, we expect to have peer-reviewed studies on the original installation on the *Tonsina* within, oh, I hope the middle of July, and because we will be more in control of the scientists when the *Prince William Sound* work is done, we hope to have peer-reviewed articles published early next year on the final set of tests. We have a report that we issued—it was issued 3 years ago but it wasn't peer-reviewed. That process has now been completed and we hope to have more peer-reviewed studies sooner this time around.

Senator INOUYE. I've spent more time than allocated. Thank you very much.

The CHAIRMAN. Thank you very much, Senator. Admiral Gilmour, the Coast Guard led the delegation to the IMO Conference on Ballast Water Management. There's obviously a discrepancy on the treatment standard, difference of opinion on the treatment standard. Are there any other areas where the IMO Convention fell short of what your expectations or the delegation's expectations were?

Admiral GILMOUR. Well, sir, as you know when we go to IMO it's the ultimate in negotiations on not only this front, but any other front. In some places we negotiate positions that we know are not going to be met and end up in the middle. I think the important parts of the IMO Convention that I talked about in my statement are the fact that ballast water management is sunsetted, which I think is very important. Also, that we do have a ballast water discharge standard to work from, which I also think is important. And whatever discharge standard we do eventually come up with, I think it would be important to have some sort of relief valve, if you will, from that system that we can later go back to if we set a standard that is too high. And I think as time, as we develop systems from prototype to actual installation, our Shipboard Technology Evaluation Program will help, but certainly the Environmental Technology Verification Program that we were starting to verify protocols to have consistent measurements, not only of the equipment, but of ways to measure the effectiveness of the equipment, are all things that will help us come up with solutions.

The CHAIRMAN. Ms. Metcalf, it's my understanding that Canadian officials have announced an approach to ballast water regula-

tion that relies on exchange. If we go forward with a program that focuses on treatment, how will U.S. shippers be able to adapt to different regimes and does it create an insurmountable conflict?

Ms. METCALF. Well, I would add, I didn't specifically mention when I said the waters of the U.S., the Lake Carriers Association is also a member of our Coalition, so we have brought their positions in on the positions of the Coalition. What the Canadians are feeling compelled to do right now is the very reason we need a global system to implement a ballast water management program. Now, we can argue about whether IMO is the floor from which we need to rise above, but for the initial control strategy we need a global program just for that reason. So that a vessel that calls in Canada or the Great Lakes where you've got two sets of waters, the U.S. and Canada, or going to four other countries, it is not struggling with the prospect of dealing with four different programs. That also, likewise, is the very reason we need a strong Federal program that convinces the states that that Federal program is good enough for their state waters. And, in fact, with other state folks that I've spoken to they are—I can't speak for them officially—but they are begging for a strong Federal program that will allow shipping the knowledge and the consistency of knowing that if they meet that program they've met the program wherever they may call.

The CHAIRMAN. Ms. Falkner, you talked about hull fouling. What has California done to address that particular problem, and what's your estimate as to how significant a problem it is in contributing to invasive species relative to ballast water?

Ms. FALKNER. In California, where the law requires us to put forward a report to the legislature next year. So we had a workshop with Sea Grant in San Francisco in April, brought together commercial and recreational vessel interests as well as academicians, ship owners, and builders, to discuss what the current status is, what we know. We're going to be holding a series of meetings with stakeholders beginning next month and kind of get a better idea of what the risks are. Much of the work that's been done recently on hull fouling has been done by, there's a very small group of people, gentlemen out of Hawaii, Dr. Gregory Ruiz from Smithsonian. We are contracting with Smithsonian and Dr. Ruiz to do some hull fouling work for us. We're not sure where that's going to take us. The industry at the commercial side is, I think, interested in having a standard best management practices guidelines developed. It's going to be a difficult issue to address. Some think it's more difficult than ballast water, but we have a hard time imagining that at this point. In California ballast water is probably a bigger risk than hull fouling but it may be too early to say. There are some systems like Hawaii where hull fouling appears to be a more significant problem than maybe ballast water is.

The CHAIRMAN. Well, thank you, and thank you again to all the witnesses for a great deal of information and focus on an important issue that I think is very appropriate for us to begin with, on the Policy Study on both the coral reef reauthorization and ballast water issue. I imagine that we will continue to deal with these issues, but specifically, I look forward to dealing with both pieces

of legislation, hopefully, before the end of the year. So I thank you for your testimony and your patience. The Committee is adjourned.

[Whereupon, at 10:37 a.m., the hearing adjourned.]

A P P E N D I X

PREPARED STATEMENT OF HON. GEORGE ALLEN, U.S. SENATOR FROM VIRGINIA

Thank you, Mr. Chairman.

I want to thank you for your leadership in scheduling this hearing regarding the impact of Ballast Water Invasive Species Management and Threats to Coral Reefs. This is an important environmental issue and one that can be remedied through innovative technology as we will be learning about today. Our role in this process, as members of this Committee, is to craft a regulatory environment that effectively deals with problems without hampering the innovation of the private sector. One of my constituents from Virginia, Mr. Joel Mandelman, will be speaking before this Committee later today. I want to take this opportunity to thank him for his appearance and for the innovative work that his company Nutech is doing in its efforts to treat ballast water so the impact of invasive species on the environment can be controlled. Invasive species cause significant economic impact and are a major threat to public health and the environment. It is estimated that damage from these organisms causes over $6 billion in damages to the United States annually. The industries most affected include power plants, municipal water treatment systems, ships and fishing. In particular, the vitality of the shellfish industry is greatly impacted.

It is my understanding that Nutech has developed a treatment system for ballast water that both reduces the spread of invasive species and reduces operating costs for ship owners. This process involves treating ballast water with ozone gas to decontaminate the water. Ozone gas has been shown to be very effective in disinfecting drinking water, swimming pools and aquariums. Testing of ozone gas treatment aboard ships in Alaska in 2000, showed that this form of water treatment greatly reduced the number of unwanted organisms found in ballast water. I am told that this innovative technology works in both fresh and salt water because ozone gas quickly degrades and reverts back to oxygen. Therefore, ozone has the potential to fulfill the requirements that the National Aquatic Invasive Species Act (S. 363) places on the discharge of ballast water in the Great Lakes. This technology also speeds up the timeline for when ships can comply with the requirements set forth in the International Maritime Organization (IMO) Treaty.

However, to encourage new technology that will improve our environment, any legislative approaches must be mindful of the needs of companies like Nutech to ensure they have the tools they need to successfully test and implement their technology. In September of this year, another test will be conducted where Nutech will install an advanced version of its technology on an oil tanker. Because of improvements in the technology, this version will cost 65 percent less than the equipment for the first test and will be able to be installed without taking the ship out-of-service.

According to the shipping industry, deep ocean ballast water exchanges cost a ship owner between $16,000 and $80,000 per exchange (which must occur every month). For this technology to be implemented, several changes must be made to induce ship owners to participate. Therefore, Nutech suggests that the implementation period in S. 363 be shortened so ships currently in service will have to treat their ballast water once the Coast Guard approves a treatment technology. Nutech believes this change ensures that ballast water treatment continues to evolve along with technology. Second, to speed up the implementation date of the legislation the Committee should expand the scope of the Coast Guard's Shipboard Evaluation and Testing Program (STEP) to allow more ships of the same owner to participate in experimental technology program. In addition, we should consider grandfathering in owners who install approved technology prior to the mandatory implementation date to current standards. Third, in terms of complying with Coast Guard regulations, ship captains must be able to prove that they have been treating their ballast water. For more effective testing, it is suggested that conducting microbe counts at every port is not an effect way to measure the quality of the ballast water. Total Residual Oxidant testing should be the main test of ballast water with microbe testing done

on a periodic basis. Finally, any Congressional action should be the exclusive legislative authority for mandating methods of treatment and discharge of ballast water. This provision will prevent conflicting regulation of discharges under the Clean Water Act.

It is vital that we on this committee work with companies such as Nutech to create an efficient regulatory environment that fosters innovation. By developing incentives that allow ship owners to invest in new technology, we will be able to better protect the environment with a lower cost to business owners. I hope that during this hearing we will consider the best way to remedy this significant problem impacting our oceans and lakes. I again would like to thank the Chairman for his leadership on this issue and look forward to working with the Committee as we figure out the best legislative approach for dealing with this problem. Thank you.

PREPARED STATEMENT OF HON. CARL LEVIN, U.S. SENATOR FROM MICHIGAN

I want to thank Chairman Sununu and Ranking Member Boxer for holding today's hearing on the important issue of ballast water and aquatic invasive species. I also want to thank the full Committee Chairman, Chairman Stevens and Ranking Member Inouye, who have been strong advocates in this area and who have introduced S. 363, the Ballast Water Management Act of 2005.

The problem of aquatic invasive species is very real to coastal and inland waterways. Invasive species-microorganisms, pathogens, plants, fish, and animals—were introduced into the United States and have become established and self-sustaining, since the days of colonization. Yet modern transportation technology and the fast pace of global trade have greatly increased the rate and severity of these invasions. The results are often ecologically and economically disastrous.

As a Senator from Michigan, a Great Lakes State, I have seen the consequences of allowing aquatic invasive species to enter our waters. Some of my colleagues may remember that back in the late eighties and nineties, the zebra mussel was released into the Great Lakes through ballast water. At that time, people considered the zebra mussel to be just a problem for the Great Lakes. The Great Lakes still suffer from zebra mussels, but now, over 20 states—as far west as California and as far north as New Hampshire—are fighting to control and prevent them. I'm sure Chairman Sununu and Ranking Member Boxer can appreciate why a national ballast regulatory program is needed now. Zebra mussels have fundamentally changed the natural dynamics of the Great Lakes. They have decimated native mussels, allowed toxins to reenter into the food chain, may be responsible for causing the collapse in the plankton essential to support sport fish and may be responsible for creating hypoxic conditions or a "Dead Zone" in Lake Erie. Many of our beaches are covered by so many zebra mussel shells that you must wear shoes to walk the beach, and it is estimated that electrical generation, water treatment, and industrial facilities spend tens of millions of dollars *every* year combating the zebra mussel.

The best effort that we have against invasive species is *prevention*. Because maritime commerce is the largest and most active pathway for new species to be introduced into our waters, I believe that we need to enact legislation that will require ballast water discharge management that will result in ballast water treatment technology onboard ships as soon as possible. I believe that technology vendors will be able to produce affordable technology that significantly improves on ballast water exchange in the very near future.

I recognize the need to put ballast technology onboard ships quickly. Under current law, ships that enter the Great Lakes must conduct ballast water exchange, empty their ballast tanks, or use alternative technology to treat their ballast water. While the Great Lakes ballast water program has probably decreased the number of new introductions, a new invader appears in the Great Lakes approximately every 8 months. Currently, there is no process in place for ships to pursue the statutory option to use alternative treatment, except for an experimental program that has onerous requirements. Consequently, ships carrying ballast water must exchange their ballast water or empty their ballast tanks. Roughly 90 percent of ships visiting the Great Lakes report no ballast onboard (NOBOB). Unfortunately, researchers believe that even when a ship empties its ballast tanks, the small amount of ballast that cannot be pumped out still carries viable organisms. When ships fill and empty their tanks in the Great Lakes, these species are flushed into the Lakes. While technologies and practices might be used to reduce the risk of those residuals, the best solution is ballast water treatment. Treatment, even to a level equivalent to ballast water exchange, would significantly improve the situation for the Great Lakes.

Senator Collins and I introduced the National Aquatic Invasive Species Act (S. 770), which directs the Coast Guard and the EPA to set an environmentally protective ballast water discharge standard. It requires ships to use ballast water exchange or a treatment which achieves the best performance level available in the near-term and phases out ballast water exchange after 2011. It also addresses the risks associated with other aspects of the ship, such as hull fouling. The benefit of this approach is not limited to the Great Lakes, and the bill will hasten technology development.

In closing, I again want to thank this subcommittee for today's hearing. Aquatic invasive species threaten all of our waters regardless whether they are inland or coastal. As the Chairman saw in his own State of New Hampshire, invasive species that enter into our waters can easily be spread, and a strong ballast water technology is needed to prevent any new invaders. I urge my colleagues to authorize legislation that does the following.

- *Has a comprehensive scope*—Federal legislation must address the introduction of invasive species from the whole ship and address all pathways of introduction, rapid response, and research;
- *Focuses on prevention*—Once introduced to the United States, invasive species are nearly impossible to eradicate, and their spread by other pathways is difficult and costly to control and eradicate. Federal legislation must close the loopholes that allow species to invade our waters and prevent them from being introduced;
- *Addresses the whole ship as a pathway*—Researchers believe that ballast water is just one way that ships carry organisms. Therefore, Federal legislation must consider the whole ship as a pathway of introduction, and address hull fouling and anchor chains; and
- *Mandates an environmentally protective standard for ballast water and facilitates broad near-term use of best available treatments*—Federal legislation should require ships to meet an environmentally protective and measurable standard at a future date certain. Legislation should also facilitate the use of treatments and practices that yield the greatest reduction in risk by as many ships as possible.

PREPARED STATEMENT OF HON. SUSAN M. COLLINS,
U.S. SENATOR FROM MAINE

Lakes, ponds, and coastal ecosystems in Maine are under attack. Aquatic invasive species threaten Maine's drinking water systems, recreation, wildlife habitat, lakefront real estate, and fisheries. Plants, such as variable-leaf milfoil, are crowding out native species. Invasive Asian shore crabs are taking over Southern New England's tidal pools and are advancing into Maine to the potential detriment of my state's lobster and clam industries.

Maine, and many other states, are attempting to fight back against these invasions. Unfortunately, states can only do so much. As with national security, protecting the integrity of our lakes, streams, and coastlines from invading species cannot be accomplished by individual states alone. We need a uniform, nationwide approach to deal effectively with invasive species. For this reason, Senator Levin and I introduced S. 770, the National Aquatic Invasive Species Act (NAISA) of 2005, to reauthorize the Nonindigenous Aquatic Nuisance Prevention and Control Act. This bipartisan legislation would create a comprehensive nationwide approach to combating alien species that invade our shores, whether these species are hitchhikers aboard a ship or carried in the cargo of an airplane.

I want to thank Chairman Sununu and Ranking Member Boxer for holding a hearing on ballast water management of aquatic invasive species. This issue is of national importance. As the Government Accountability Office reported: "[I]nvasive species are one of the most serious, yet least appreciated, environmental threats of the 21st century."

Federal legislation to address aquatic invasive species must have the following features to effectively protective protect U.S. aquatic ecosystem , and the economies they support:

- *Comprehensive scope*—Federal legislation must address the introduction of invasive species from the whole ship as well as address other pathways of introduction such as importation for the pet trade or for food markets, rapid response, and research;

- *Focus on prevention*—Once introduced to the United States, highly invasive species such as the zebra mussel, European green crab, and watermilfoil are often impossible to eradicate, and their spread by secondary vectors is difficult and costly to control;
- *Address the whole ship as a pathway*—Current research suggests that hull fouling is a significant contributor in aquatic invasive species introductions; therefore, Federal legislation must consider the whole ship as a vector of introduction, not just ballast water;
- *Set environmentally protective standard for ballast water, and facilitate broad near-term use of best treatments available*—Federal legislation should require ships to meet an environmentally protective, measurable standard at a certain date in the future, but meanwhile facilitate the use, by as many ships as possible, of treatments and practices that yield the greatest reduction in risk from aquatic invasive species possible; and,
- *Retain state sovereignty*—Federal legislation should permit states to take steps to protect their aquatic resources from damage by ship-mediated introductions of aquatic invasive species if the Federal program proves ineffective.
- *The need for comprehensive national legislation focused on prevention*—The stakes are high when invasive species are unintentionally introduced into our Nation's waters. Invasive species endanger ecosystems, reduce biodiversity, and threaten native species. They disrupt people's lives and livelihoods by lowering property values, impairing commercial fishing and aquaculture, degrading recreational experiences, and damaging public water supplies.

In the 1950s, European green crabs swarmed the Maine coast and literally ate the bottom out of Maine's soft-shell clam industry by the 1980s. Many clam diggers were forced to go after other fisheries or find new vocations. In just one decade, this invader reduced the number of clam diggers in Maine from nearly 5,000 in the 1940s, to fewer than 1,500 in the 1950s. The European green crab was first documented on the West Coast in San Francisco Bay in 1989. Since its discovery in California, the European green crab has spread northward to Oregon and Washington. If the European green crab becomes established in on the West Coast, it may have a significant impact on the clam, oyster, and mussel industries, similar to the impacts on Maine. In California, the green crab is thought to have caused the loss of as much as 50 percent of Manila clam stocks and substantial decreases in other crab populations. European green crabs currently cost an estimated $44 million a year in damage and control efforts in the United States.

The European green crab provides the textbook example why the United States needs comprehensive legislation to not only address ballast water, and to improve coordination to prevent the interstate spread of these species once they reach U.S. shores. The European green crab likely hitched a ride to the East Coast in the dry ballast of a ship. Once here it spread from New Jersey north to Nova Scotia, and south to the Chesapeake Bay. Its spread to the West Coast could have been caused by a number of human factors that are responsible for the spread the species to new areas. Among these is ballast water from incoming ships, seaweed packed with lobsters, and through bait. Comprehensive legislation would address these various pathways for the introduction of species and will help states coordinate efforts to prevent the spread of a species once it enters an aquatic ecosystem.

The National Aquatic Invasive Species Act of 2005, is the most comprehensive effort ever to address the threat of invasive species. By authorizing $836 million over 6 years, this legislation would open numerous new fronts in our war against invasive species. The bill directs the Coast Guard to develop regulations that will end the easy cruise of invasive species into U.S. waters through the ballast water of international ships, and would provide the Coast Guard with $6 million per year to develop and implement these regulations.

The bill also would provide $30 million per year for a grant program to assist state efforts to prevent the spread of invasive species. It would provide $12 million per year for the Army Corps of Engineers, and Fish and Wildlife Service, to contain and control invasive species. Finally, the Levin-Collins bill would authorize $30 million annually for research, education, and outreach.

The most effective means of stopping invading species is to attack them before they attack us. We need an early alert, rapid response system to combat invading species before they have a chance to take hold. For the first time, this bill would establish a national monitoring network to detect newly introduced species, while providing $25 million to the Secretary of the Interior to create a rapid response fund to help states and regions respond quickly once invasive species have been detected. This bill is our best effort at preventing the next wave of invasive species from tak-

ing hold and decimating industries and destroying waterways throughout the country. In Washington, the state does not believe it can eliminate the European green crab, but it is trying to control the population to the point where it is not disastrous to the surrounding ecosystem. NAISA would give the states the tools and resources for this effort.

While introduction of aquatic invasive species through ballast water poses the greatest threat to our waters, non-native species imported for live food, aquaculture, or the pet trade can escape and become invasive. The snakehead fish that invaded a Maryland pond and now the Potomac River is one example. Currently, there is no uniform, systematic process for screening or regulating the proposed importation of live organisms to prevent the introduction of harmful invasive species. The NAISA legislation creates a screening process for planned introductions of non-indigenous species not already in trade. The legislation would prohibit the importation of species that are determined to pose a high risk of becoming invasive or species with insufficient information to determine the risk.

Prevention is key, but when it fails, we must respond rapidly to detect invasive species and stop their spread. This legislation will help states and regional organizations detect and respond to future invasions through early detection and rapid response. The bill provides funding to support ecological surveys to rapidly detect recently-established aquatic invasive species and to develop and implement rapid response plans to eradicate or control aquatic invasive species.

The legislation also takes precautions to ensure that the methods we use to manage and control invasive species do not adversely affect health, public safety, or the environment. Ensuring the environmental soundness of our response is critical if we are to avoid unintended consequences. In the 1990s, biologists in Maine found DDT and other pesticides in the mudflats of Maine. In an attempt to eradicate the green crab, the state, and individuals, had applied pesticides to the flats about 50 years earlier. We must be careful that our current attempts to remove invasive species do not cause even more serious problems.

Ship Mediated Introduction of Aquatic Invasive Species—One of the leading pathways for the introduction of aquatic organisms to U.S. waters from abroad is through transoceanic vessels. Commercial vessels fill and release ballast tanks with seawater as a means of stabilization. The ballast water contains live organisms from plankton to adult fish that are transported and released through this pathway. We are still on a steep learning curve regarding the best treatments to use to address this problem. However, while a perfect treatment still eludes us, many possible treatments would improve substantially on ballast water exchange, our current fallback. The best approach to resolving this situation is to facilitate use, by as many ships as possible, of the best methods available as soon as possible and require improvement over time.

NAISA provides a model for a framework. Since the last reauthorization of this legislation in 1996, there has been growing consensus about the value of a mandatory national program to prevent movement of organisms by ships. NAISA will require all ships to prepare Aquatic Invasive Management Plans, carry out best management practices, and document all ballast operations and management activities related to this legislation. The legislation would require the U.S. Coast Guard, in concurrence with the Environmental Protection Agency, to set a protective discharge standard for ballast water, and require ballast water exchange or the best treatments possible until 2011. After that date, ballast water exchange expires as an option. In addition, the Coast Guard and EPA must promulgate regulations related to other ship operations that pose a significant risk of introduction of aquatic invasive species. The legislation protects the investments of ship owners in treatments by providing a 10-year approval period for any approved installation. These measures will ensure that the United States is taking the most effective actions possible to protect our waters, ecosystems, and industries.

Lastly, NAISA does not preempt state efforts to better control ballast water discharges and other ship-mediated vectors. For too long, the Federal Government has taken little action to address the environmental and economic threats posed by ships, states should be allowed to continue their efforts at least until there is a strong national program enacted and implemented.

Nonindigenous species infest and degrade U.S. waterways and coastal areas in virtually every region of the United States. We are losing the fight to protect the Nation's waters from expensive and environmentally damaging invasions by aquatic nuisance species. Every day that passes without protections to prevent new invasions increases the threat that another exotic species will establish itself, altering the ecosystem in our great waters.

The NAISA legislation provides the framework for a comprehensive and coordinated response at the Federal, state, and local levels to prevent the spread of aquat-

ic invasive species. I urge my colleagues to cosponsor this legislation and work to move the bill swiftly through the Senate.

PREPARED STATEMENT OF DR. CELIA M. SMITH, PROFESSOR OF BOTANY, UNIVERSITY OF HAWAI'I

Regarding the Impacts of Ballast Water and Related Hull-Fouling to Hawaii

Greetings, Chairman Stevens, Co-Chair Inouye and distinguished members of the National Ocean Policy Study Subcommittee of the Commerce Committee. This is the testimony for Dr. Celia M. Smith, Professor of Botany at the University of Hawai'i. With this testimony, I'd like to argue the significance of impacts from ballast water and hull-fouling for invasive, non-indigenous species introductions to the Hawaiian archipelago. Thank you for this opportunity to outline mechanisms and threats associated with these invasive species, emphasizing our Hawaiian ecosystems.

I have four points that I would like to make today. First, our islands' coastal ecosystems are unparalleled assemblages of native species of fish, invertebrates and marine plants that have evolved for several million years, in relative isolation from the U.S. mainland, or any other significant land mass. About 25 percent of our marine biota is unique to the Hawaiian Islands. Consequently, in a pristine setting, our ecosystems are species-rich communities, and highly productive. Our geographic isolation brought us one other novelty—the ability to detect when a new species has arrived, with relative ease. Since about 1950, these kinds of observations have lead to a new awareness in a tropical setting. Our native marine flora and fauna are under constant pressure from the rising tide of introductions and species extinctions arising from human activities. This situation will ultimately homogenize the tropical Pacific marine biota unless something is done, now.

My second point is borrowed from colleague Dr. Lucius Eldredge (Bishop Museum), and his collaborators. Through their efforts, we have learned that hundreds of invertebrate species have been introduced to the Hawaiian Islands. Worse, is the report that over three-quarters of those species introduced by ballast water (over 15 species), hull-fouling (over 200 species), or solid ballast (over 20 species), have established in Hawaiian waters, especially harbors.

In the marine plant arena, we have fewer numbers of introductions associated with ballast or hull-fouling. Yet, as my third point, what marine plants lack in numbers, they make up for with stunning levels of biomass. At least two algal introductions quite clearly can be followed back to hull-fouling as the vector for introduction: *Acanthophora spicifera,* introduced about 1950, and in about 10 years spread to all the main Hawaiian Islands, and *Dictyota flabelliformis,* our most recent arrival on a dry dock from southern California. *Acanthophora spicifera* is now one of the most common algae in the Hawaiian Islands. *Hypnea musciformis,* another introduction, probably spread via hull-fouling to our neighbor islands. Biomass of this alga accumulates at a rate of tens of tons per year in Kihei Maui and has been tied to an estimated $20 million per year lost revenue for the county.

Finally, while the State of Hawaii does have occasional ciguatera outbreaks, we have been spared large scale outbreaks of redtides, brown tides, and other phytoplankton blooms that have dire consequences to coastal food chains and humans. Ballast water is a known vector for introduction of toxic phytoplankton to areas in the world where toxic species did not occur. For my fourth point, I urge this Committee to put in force the strongest possible regulations to protect our state from these toxic species.

Thank you again for the opportunity to comment on the introduction of non-native species through the discharge of ballast water and hull-fouling from ships.

Regarding the Current Threats to Coral Ecosystems in Hawaii

Greetings, Chairman Stevens, Co-Chair Inouye, and distinguished members of the National Ocean Policy Study Subcommittee of the Commerce Committee. This is the testimony for Dr. Celia M. Smith, Professor of Botany at the University of Hawaii. With this testimony, I'd like to argue the significance of threats to coral reefs and coral reef ecosystems in the Hawaiian archipelago. Thank you for this opportunity.

I have three points that I would like to make today. First, as in my earlier testimony, our islands' coastal ecosystems are unparalleled assemblages of native species of fish, invertebrates, and marine plants that have evolved for several million years, in relative isolation from the U.S. mainland or any other significant land mass. About 25 percent of our marine biota is unique to the Hawaiian Islands. Consequently, in a pristine setting, our ecosystems are species-rich communities, and highly productive. Our geographic isolation brought us one other novelty—the ability to detect when a new species has arrived, with relative ease. Since about 1950,

these kinds of observations have lead to a new awareness in a tropical setting. Our native marine flora and fauna are under constant pressure from the rising tide of introductions and species extinctions arising from human activities. Perhaps, surprisingly though, known hull-foulers have jumped from harbors to reef regions, and become ecological dominants. These two issues, healthy reefs and alien species introductions by whatever vector, are linked in a number of ways.

My second point goes to the impacts of these alien species introductions to coral reefs. Intentional introductions have shifted the fundamental competitive advantages that keep a coral ecosystem poised with coral dominance. Weedy cultivars of marine crop plants can quickly overgrow patch reefs once dominated by coral, produce four times the biomass of our most productive Hawaiian species. Reductions in the diversity and complexity often associated with coral reefs are some of the early costs that we've already observed. Longer term costs to us will be being realized as losses in fisheries, losses in aesthetic values as shorelines turn murky, losses in mechanical strength for our islands against hurricane wave forces.

My third point goes to underscore the complexity of coral reef ecosystems and what we might lose. As Lewis and Clark searched the boundaries of our new country adding dozens of new plant species, we are only beginning to understand the boundaries of a reef ecosystem. In any given day through our deep diving fieldwork, we add new plant species to the Hawaiian flora. Are there connections among populations of organisms? How might interactions among groups of species change over short and long-term natural disturbances? This is the stuff of active research. The scientists working to answer to these questions are pressed by the threats posed by vessel groundings, overharvesting and coastal run off—short and long-term human disturbances that could change reef ecosystems profoundly and in such a way that the reefs might not recover.

I urge this committee to put in force the strongest possible protections for these vulnerable and valuable ecosystems. Thank you again for the opportunity to comment on these important issues.

PREPARED STATEMENT OF THE AMERICAN WATERWAYS OPERATORS (AWO)

The American Waterways Operators (AWO) is the national trade association of the U.S. tugboat, towboat, and barge industry. It comprises more than 400 member companies that operate throughout the inland and coastal waters of the United States. The barge and towing vessel fleet, the largest single segment of the U.S. domestic vessel fleet, consists of nearly 4,000 tugboats and towboats, and over 27,000 barges of all types. These vessels transit 25,000 miles of inland and intracoastal waterways, the Great Lakes, and the Atlantic, Pacific, and Gulf coasts. AWO members have a long record of safety leadership and environmental stewardship, as evidenced by the AWO Responsible Carrier Program, a third-party-audited safety management system with which all AWO members must comply as a condition of association membership, and the first-of-its-kind Coast Guard-AWO Safety Partnership.

AWO appreciates the opportunity to submit these comments for the record. AWO is an active member of the Shipping Industry Ballast Water Coalition (Coalition) and strongly supports the statement provided by Ms. Kathy Metcalf at the June 15, 2005 hearing on behalf of the Coalition. As a member of the Coalition, AWO supports a comprehensive, national strategy for ballast water management. *AWO supports S. 363 with several changes to strengthen the bill's provisions on Federal preemption, Federal exclusivity, and a safety exemption from ballast water exchange requirements for barge and towing vessel operations.*

Tug and Barge Industry Ballast Water Practices

As operators of small vessels, unmanned barges, and vessels that are most frequently employed in domestic service, the barge and towing industry has a unique set of concerns related to ballast water management. Historically, international and national ballast water requirements have been designed for sea-going ships and crewed vessels, not unmanned barges. Barges have typically not been the focus of ballast water legislation or regulations since most are not manned vessels and were not designed nor intended to exchange ballast at sea. However, barges and towing vessels do engage in ballasting operations, and in many cases these operations are essential for safe operations. *In order to avoid grafting ill-fitting legislative mandates onto small vessels, unmanned barges, and vessels in domestic service, it is important to understand typical ballasting practices in the barge and towing industry and ensure that legislation is drafted with the operations and limitations of barges and towing vessels in mind.*

While ballast water practices in the barge and towing industry are diverse, it is common to take on or discharge ballast in the harbor to adjust the trim of the vessel based on specific characteristics of the cargo and how it is stowed or loaded onto the barge. In some operations, it is necessary to ballast and deballast at the dock to keep the barge at the proper freeboard (height above the water) compared to the level of the dock. In Hawaii and Alaska, for example, cargo on deck barges is loaded and unloaded using ramps between the dock and the deck of the barge. If the barge rides too high or too low in the water, the angle of the ramp can be too steep to transfer cargo safely. Because of tide changes and because the docks at different ports are at different heights, a barge that has the proper freeboard for loading in one port is often at the wrong freeboard for unloading in the second port. In order to properly adjust the freeboard to discharge cargo safely, it may be necessary to discharge ballast water at the dock.

Ballast water is also used to adjust the trim of a vessel (either a barge or a towing vessel) based on the cargo carried and the requirements of a particular voyage. Tugboats and towboats make adjustments to their ballast water while underway to compensate for fuel burn-off. These highly technical and voyage-specific adjustments are made throughout the waterway system at the discretion of the vessel master to ensure that the vessel operates safely within its design parameters.

Safety Considerations

Conducting underway ballast water exchange on barges, as would be required under S. 363, poses serious safety concerns for crewmembers operating tugs and barges. Most barges are unmanned, and ballasting at sea would require bringing the tug alongside a towed barge and getting a crewmember onboard the barge to operate the pumps. Waters are rarely calm enough to allow the tug and barge to stay safely alongside each other, and even in calm waters, this operation could pose a potentially serious safety risk. A second option would be to send a crew member to the barge in a small boat. The crew member would then have to climb the sheer wall of the barge at sea and operate pumps from the rolling deck of the barge. In either scenario, getting a crewmember on and off the barge is inherently risky and is considered by most in the barge and towing industry to be a dangerous, life-threatening operation.

The Coast Guard, the states, and the shipping industry have all recognized the significant risks involved in conducting ballast water exchange on barges. In the preamble to its final rule implementing the National Invasive Species Act of 1996, the Coast Guard noted, "For example, in many situations, it may be inherently unsafe to conduct an exchange of ballast by an unmanned barge." (Vol. 66, Number 225, *Federal Register* Nov. 21, 2001.) The States of Washington and Oregon have also recognized these risks by limiting the scope of state ballast water regulations to self-propelled vessels. In the interest of safety, the Shipping Industry Ballast Water Coalition has reached the same conclusion and determined that ballast water exchange involving unmanned barges is inherently unsafe.

Safety concerns associated with ballast water exchange extend even to the most modern generation of tug-barge units. Articulated tug-barge units (ATBs) have different, but significant, difficulties with conducting ballast water exchange because of the way they are configured. An ATB consists of a tug and barge joined together as a unit. An ATB is connected in a notch by pins and the tug and barge must maintain the same draft in order to stay locked into position. It is impossible to make adjustments to how the tug and barge are connected while the vessel is underway. As a result, accepted industry practice is generally not to conduct ballast water exchange on ATBs. (AWO is aware of one member company that has made significant physical modifications to its four ATBs to be able to conduct ballast water exchange while underway. However, this company continues to research options for treating ballast water on the ATBs because it has serious concerns with putting crews onboard barges at sea, and concerns about vessel stress when removing ballast water from a barge on the open ocean.)

AWO Recommendations for S. 363

AWO supports the recommendations of the Shipping Industry Ballast Water Coalition to amend and improve S. 363. Consistent application of Federal requirements for ballast water operations is essential to the efficient operation of tugboats, towboats, and barges. Patchwork regulatory requirements applied on a state-by-state or waterway-by-waterway basis are onerous and hinder commerce. Moreover, towing vessels and barges operate 24 hours a day, 7 days a week, throughout U.S. waters and cannot operate efficiently if regulated by a mechanism other than a strong, uniform Federal program. *AWO strongly supports the Coalition's recommendation that Federal legislation should preempt state regulation of the manage-*

ment and control of ballast water discharges in the U.S. AWO also urges Congress to specify that enacted ballast water legislation is to be the exclusive Federal program that regulates ballast water management and discharges in U.S. waters.

Safe operation of barges and towing vessels necessitates ballast water uptake and discharge. The prescriptive ballast water exchange provisions in S. 363 that do not differentiate between the minimal risks of ballast water exchange on an ocean-going ship versus the significant risks on an unmanned, non-self propelled barge are problematic for the barge and towing industry. *S. 363 should include an express provision that exempts barges and towing vessels from the ballast water exchange requirements.* As described in the Coalition's statement, while the existing safety exemption in the legislation would arguably cover barge and towing vessel operations, it would be more appropriate for Congress to expressly state its intent regarding this known hazardous operation, rather than subject barge and towing operators to additional scrutiny if they invoke the safety exemption. Moreover, the requirements that ballast water exchange be conducted at minimum distances from land and in minimum depths of water as prescribed in S. 363, would preclude most barges and towing vessels from conducting exchange, even if it were safe to do so, because most vessels rarely transit outside the Exclusive Economic Zone (EEZ).

AWO members, because of their deep commitment to marine safety and environmental protection, are currently exploring ballast water treatment options other than ballast water exchange which could serve as safer alternatives to ballast water exchange in the future. *At present, there are no acceptable means of ballast water exchange nor any safe and effective alternative ballast water treatment technologies viable for tug and barge application; however, the establishment of a national ballast water treatment standard should serve to accelerate this process.*

Thank you for the opportunity to present our views for the record. We would be pleased to provide any additional information the Subcommittee may require.

PREPARED STATEMENT OF MICHAEL L. HAM, SECRETARIAT, UNITED STATES ALL ISLANDS CORAL REEF INITIATIVE COORDINATING COMMITTEE (USAICRICC)

The United States All Islands Coral Reef Initiative Coordinating Committee (USAICRICC) extends our appreciation for this opportunity to present comments to the U.S. Senate Commerce Committee, on the reauthorization of the Coral Reef Conservation Act of 2000 (CRCA).

The passage of the CRCA in 2000, began the process for seriously undertaking the protection and conservation of the Nation's coral reefs and their resources. The process for protection and management of coral reefs, which began with Presidential Executive Order 13089 in 1998, created not only the U.S. Coral Reef Task Force, but a unique and far reaching partnership between the Federal and the State/territorial/commonwealth governments. This partnership has become the model for environmental management. The CRCA supported and expanded on that effort by defining the focused efforts of the National Oceanic and Atmospheric Administration (NOAA), and provided the funding mechanism for undertaking the difficult and unprecedented work of environmental management of these most fragile ecosystems in America's tropical waters.

The reauthorization process allows us to not only provide for the continuation of these efforts, but to build on them and to make the Act more responsive to management needs. The following comments are intended to support that end. These are presented as a consensus report of the USAICRICC, but do not preclude some differences of views between the island jurisdictions of the United States. The USAICRICC is composed of the designated Points-of-Contact for the Governors of Hawaii, Guam, Puerto Rico, American Samoa, U.S. Virgin Islands, and Commonwealth of the Northern Mariana Islands, but these remarks are not intended to be interpreted as the official comments of those Governors.

The coral reefs of the United States provide many billions of dollars of the Gross National Product. Through the Nation's fisheries, recreation, tourism, shoreline protection, medicinal, and pharmaceutical industries, the reefs provide for jobs, products, diet, and health. They help provide for America's economic, environmental, and political security. While most of the Nation never experiences coral reefs first hand, all Americans are reliant on them and benefit from their protection and conservation.

Specifics on the Draft Bill

Section 2. While we certainly agree with the suggested division of resources in this section, the truth is that the jurisdictions which contain more than 80 percent of the Nation's coral reefs directly receive no more than 15 percent of the total mon-

ies available under the CRCA. The Federal activities and structure that exists is, generally necessary, and we agree that many of the projects undertaken at the Federal partnership level do help the jurisdictions. However, an increase in the funds available to the jurisdictions with the responsibilities for coral reef management, protection and conservation is essential if we are going to achieve the goals of the CRCA. Additionally, it is important that funding become programmatic in structure within NOAA, in order to better ensure more predictable and dependable funding. The following language, below, is offered as descriptive of these comments.

> Funding to support wise management of coral reef needs to be structured to provide significant support federally at the local level recognizing that 82+ percent of the coral reefs are in local (state, territorial and commonwealth) waters. 35 percent of all Federal funds allocated to coral reefs shall be distributed to island jurisdictions (American Samoa, Commonwealth of the Northern Mariana Islands, Guam, Hawaii, Puerto Rico, and United States Virgin Islands. Out of the 35 percent, the Federal Government shall receive 5 percent (35–5 percent) to administer the distribution of funds. Administering funds shall be accomplished through the adoption of Federal eligibility requirements. These requirements shall be limited to the following: annual fiscal reporting, annual progress reports. Funds shall be active up to 3 years. Eligibility requirements will also define allowable activities and maximize the local authority to define and implement programs to effectively manage and sustain coral reefs. Activities may include but are not limited to: development and implementation of management actions, research, staffing, training, communication, operational support, enforcement, and education. These parameters may be revised or updated to make the process more effective with the intentions of minimizing administrative oversight and maximizing the funding used toward implementation.

The approach utilized by the United States Fish and Wildlife Service (USFWS) in administering the Sport Fish and Wildlife Restoration Funds, should be used as a model for establishing eligibility requirements and allowing local jurisdictions the maximum flexibility in developing programs.

Section 206. Emergency Assistance

The All Islands Committee supports this new language. Experience has shown us that, not only can communities recover more quickly and more fully, but resource damage can be reduced significantly with immediate attention to environmental damage following disasters. The mechanism to provide that immediate attention did not exist in the disaster recovery process prior to this year, when the Federal Emergency Management Agency (FEMA) was given the authority and responsibility for such through Emergency Support Function 11 of the National Response Plan, but the first opportunity to invoke that authority following Hurricane Olaf in American Samoa, they failed to respond and unnecessary damage to the coral reef resources resulted. As provided for in the National Response Plan, Federal action to support natural resource recovery in all fifty states, the territories, and commonwealths would have been possible. FEMA's stated reasons for not activating that responsibility, (no funds to do so, they saw no connection between environmental damage and public health, and possible conflicts with the Stafford Act), indicate that FEMA would be unlikely to provide for natural resources recovery help to any U.S. jurisdiction after natural disasters, given that two of those reasons would exist after nearly every natural disaster. The language supplied in this section and in Section 208(4) should go far in resolving this problem in regard to coral reef response, but will not address the problems other states will face following natural disasters and their need to recover their natural resources in order to fully and quickly recover their communities.

There are two issues which should be included in this section to ensure the response being described is accomplished. First, it is important that NOAA not be the only agency involved in this response. We would suggest that line 24 be amended to read; *"The Secretary may [insert "shall"], undertake or authorize [insert "in partnership with the all Federal agencies with responsibilities for disaster relief"] all necessary. . . ."* Second, it should include language that would ensure that either reimbursement to the agencies for their emergency expenditures under this section, or provide a fund to be used for this purpose.

Section 208 Report to Congress

We believe that the reports to Congress, as identified in this section, will serve a multitude of purposes, including providing information which can help improve management of the coral reef resources at both the Federal and local levels, and better delivery of the funds and support required for undertaking the responsibil-

ities of the Act. We would, however, caution that reporting requirements all too often consume personnel time and effort. We would request that, at a minimum, the reports dealing with "health of the reefs" be required no more often than once every 3 years.

In short, we strongly support the approach being taken in the draft bill and believe that the draft bill holds the potential for greatly improving our ability to provide for the conservation of our fragile and important coral reef resources. We are hopeful that new allocations identified in the draft bill can resolve the current inequities in fund allocations. While we do not suggest reducing the Federal effort, any new monies allocated should, first and foremost, be directed to the jurisdictions, where the day-to-day responsibility for coral reef protection and conservation resides.

We should state that we look forward to continuing to work with the Senate on this issue as it moves forward, and in developing the mechanisms and possibly other legislation that will provide support to the managers who are designated as the responsible parties for coral reef conservation. We have, over the past decade, developed a process for management in coordination with science for these issues, a unique and successful Federal-state/territory/commonwealth partnership for action, and local action strategies supported by a wide and divergent range of stakeholders through an inclusion process of community participation in the process, and we believe that the resources are being served well through this approach.

Conclusion

In closing, I want to repeat that the efforts in coral reef management, protection and conservation, and the development of successful partnerships between the state/territorial/commonwealth and Federal governments and the partnerships between management, science, and non-governmental stakeholders, which began with the U.S. Coral Reef Initiative in 1994, have been more than simply successful up to this point. It was far too long before we, as a Nation began understanding the importance of, and expressing our appreciation for our Nation's coral reef resources, but in the decade just passed, we have made great strides and the CRCA has been an extremely important element in that success. We have a long way to go yet, and the CRCA has an important role to play in continuing to move forward. We reiterate our request that 30 percent of the total funds authorized through the CRCA be given directly to the state/territory and commonwealth jurisdictions for implementation of projects and programs that will directly impact management and protection of coral reefs and coral reef resources.

We appreciate the efforts of this committee and its staff in developing this draft bill, and once again thank the Committee for providing us the opportunity to comment.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. DANIEL K. INOUYE TO TIMOTHY R.E. KEENEY

Coral Mapping and Assessment B Progress and Needs

Question 1. The interagency Coral Reef Task Force identified mapping and assessment as one of the critical needs in coral reef protection, particularly in the Pacific. In addition, the U.S. Commission on Ocean Policy recommended increased research and characterization of coral reefs. Why is mapping and assessment of corals so crucial?

Answer. Assessment and monitoring through a continued program of surveys, systematically undertaken to provide a series of observations over time, is the key to understanding and reducing threats to coral reef ecosystems. Monitoring can also be used to evaluate the effectiveness of specific management strategies, evaluate restoration projects, and serve as an early warning system for identifying declines in ecosystem health. A combination of direct observations (e.g. diver observations), automated sensors (e.g. *in situ* monitoring buoys), and remote sensing (e.g. satellite imagery) provides a suite of environmental indices to inform resource managers and policymakers.

Mapping is crucial for several reasons, including:

1. Understanding the spatial distribution and assessing the health of coral reef ecosystems helps managers better monitor changes in coral over time, and improves understanding of coral reef ecosystems. This understanding allows the development of informed strategies for more effective conservation efforts.

2. Maps provide a spatial context for understanding larger-scale ecological processes.

3. Understanding the spatial distribution of coral reef habitats allows scientists to focus studies on particular habitat types and structure research to better understand functional relationships between habitat types.

4. Maps of coral reef ecosystems help differentiate sensitive areas from areas that are more appropriate for human activity. For example, anchoring of large ships in a sand patch is far less destructive than anchoring on a reef or in a seagrass bed.

5. For monitoring purposes, coral reef ecosystem maps help scientists track the movement of fish and invertebrate species between habitats and determine where species are likely to be found at different life stages. This process is also helpful in determining the extent of essential fish habitat (EFH) identifications and descriptions for species managed under the Magnuson-Stevens Fishery Conservation and Management Act.

Question 1a. How much progress have we made since we passed the Coral Reef Conservation Act in 2000? What do we know now that we did not know then?

Answer. By the end of Fiscal Year 2005 NOAA will have completed planned synoptic habitat maps for shallow-water coral reefs in the Main and Northwestern Hawaiian Islands, American Samoa, Guam, the Commonwealth of the Northern Mariana Islands, Puerto Rico, and the U.S. Virgin Islands. This area includes approximately 37 percent of U.S. near-shore waters that contain shallow coral reefs. NOAA's mapping and assessment efforts have greatly increased estimates of the potential coral reef ecosystems in Florida. Currently, digital shallow water benthic habitat maps have been published and distributed for over 10,500 km^2 of shallow water coral reef habitat. Coastal managers, scientists, and educational groups are using these maps. NOAA's mapping and characterization activities in deeper waters have revealed tropical reefs at greater depths than previously known, and have improved our understanding of the contribution of these habitats to fisheries.

Our knowledge of coral reefs has increased significantly since the Coral Reef Conservation Act was passed in 2000. The U.S. coral reef jurisdictions monitor environmental conditions associated with their coral reefs, including water quality, benthic habitats, and associated biological communities. The coral reef jurisdictions have focused their monitoring efforts on these parameters because they: (1) are well-documented as indicators of specific stressors; (2) are likely to be of concern if measurements change markedly over time; (3) can be used to define a desired biological condition; and (4) may contribute to the development of an index of biotic integrity. As a result of these monitoring efforts, managers have obtained a better understanding of the threats to their coral reefs; which threats are of most concern or are increasing in concern within each jurisdiction; and the effect(s) each threat is having.

We have also gained a better understanding of patterns of coral bleaching, the nature of coral diseases, and pathways of disease transmission. NOAA has collaborated with numerous Federal, state, academic, and non-governmental agencies to create partnerships for coral reef conservation. We have determined where gaps in information exist and have created a well-established forum of experts. In addition, outreach and education efforts for coral reefs have increased and are better coordinated.

Question 1b. How much do you estimate completing mapping, monitoring, and characterization would cost?

Answer. The costs of mapping, monitoring, and characterization depend on the water depth and desired resolution of mapping, as well as the frequency and spatial coverage of monitoring efforts.

- *Mapping:* High-resolution satellite imagery (*e.g.,* IKONOS satellite) provides cost-effective and robust data with spectral and spatial resolution suitable for shallow water (less than 40 meters in depth) benthic mapping. Estimated costs to produce maps are $285/km^2$. It is estimated that mapping the 13,000 km^2 of priority shallow water areas in Florida, the last of the seven U.S. coral reef jurisdictions to be mapped, will cost $4.4 million.

  Mapping coral habitats in deeper water requires different technologies, primarily shipboard multibeam sonar. Cost estimates for gathering and initial shipboard processing of multibeam and backscatter data are about $1,500 per km^2 in depths between 18–183 meters. In contrast to our work in shallow water, comparatively few of the deeper water tropical coral reefs and associated habitats have been mapped in U.S. waters. To date, NOAA has taken a targeted approach of mapping only the highest priority deeper water areas.
- *Monitoring and Assessment:* NOAA currently expends more than $5 million annually on monitoring coral reef ecosystems in the United States. This amount complements important monitoring activities conducted by the states, terri-

tories, and other Federal agencies (principally the Environmental Protection Agency (EPA) and the Department of the Interior (DOI)), and does not include fine-scale monitoring that may be conducted in association with specific projects or research programs. NOAA's current goal is to ensure reasonable annual monitoring coverage in priority high-use areas (*e.g.,* inside and outside marine protected areas or near major tourism and development areas) and biennial monitoring of more remote areas. NOAA is also providing global monitoring of sea surface temperatures and associated coral bleaching alerts.

- *Characterization:* A cost estimate for characterization is not readily available. Many of the reefs are in remote locations, which greatly increases the cost associated with conducting a baseline characterization of all U.S. coral reefs. Some characterization is included in the mapping cost.

Question 1c. Is NOAA planning to leverage funds by working with other agencies and outside entities?

Answer. Yes, NOAA plans to continue to leverage funds, and various in-kind contributions, by working with other agencies and outside entities. The NOAA Coral Ecosystem Mapping Team has worked collaboratively with other Federal, state, and territorial government agencies in Puerto Rico, the U.S. Virgin Islands, and Hawaii for many years. The NOAA Coral Ecosystem Mapping Team will continue to identify opportunities to leverage investments made by other Federal and state agencies, universities, and other entities to complete the NOAA mapping effort.

The following examples highlight recent collaborations:

- The NOAA Coral Ecosystem Mapping Team is working with the Florida Department of Environmental Protection to identify matching funds to support mapping southern Florida coral ecosystems, as part of their recently completed Local Action Strategies report.
- The NOAA Coral Ecosystem Mapping Team is working with the Florida Fish and Wildlife Conservation Commission to identify hard bottom and seagrass characterization efforts that will require imagery collection and can be used to support southern Florida coral ecosystem mapping efforts.
- The NOAA Coral Ecosystem Mapping Team working with the U.S. Geological Survey (USGS) to evaluate imagery collected by the USGS Digital Orthophoto map development program, to assess the usefulness of their images for mapping coral ecosystems in southern Florida.
- The NOAA Coral Ecosystem Mapping Team is coordinating with USGS on their shallow-water LIDAR data collection efforts in the Florida Keys and Dry Tortugas for characterizing coral ecosystems and evaluating hurricane impacts.
- The current monitoring and observing activities of NOAA (collectively the Coral Reef Ecosystem Integrated Observing System (CREIOS)) rely on partnerships with Federal agencies; state, territorial, and local governments; and nongovernmental organizations to continually implement a wide range of monitoring activities. Our partners provide in-kind contributions of time and expertise for the sighting, installation, and maintenance of automatic observing systems such as the Coral Reef Early Warning System (CREWS) towers/buoys in the Atlantic/Caribbean and in the Pacific.
- NOAA, the National Park Service, and the U.S. Fish and Wildlife Service (USFWS) regularly collaborate and leverage resources to monitor National Parks and Refuges that contain many of the Nation's most pristine coral reefs. USFWS personnel regularly provide staff and expertise on NOAA research, assessment and monitoring cruises, to the Northwestern Hawaiian Islands and other remote island areas. In addition, USFWS personnel often assist with compiling the data obtained by the cruises. The first coral reef assessments of Navassa Island have been made possible through cost-sharing between USFWS and NOAA.

Removing and Responding to Vessel Groundings on Coral Reefs

Question 2. You were very involved a few years ago in obtaining Federal assistance to remove 9 abandoned vessels from Pago Pago harbor, which had been driven onto the reef, and were responsible for both polluting the waters and crushing the coral resources. It was extremely hard to find a responsible program or funding needed to address the problem, but through persistence, you were able to leverage the help of both NOAA and the Coast Guard. Could you describe the scope of the problem today, including the various threats they pose?

Answer. Abandoned and derelict vessels are a significant problem in coastal bays, harbors, and estuaries. The cause of abandonment varies regionally. In certain areas, such as South Florida, storm damaged vessels are a major cause of abandon-

ment. In the Gulf Coast, abandoned barges and oil field vessels are a problem. Abandoned vessels are a hazard to navigation and pose additional threats, including pollution threats from fuels, paints and batteries, as well as entrapment hazards from the vessel or fishing gear aboard. In some cases, the site of an abandoned vessel can become an area where illegal dumping of oils and household/industrial debris occurs. Additional negative impacts associated with abandoned vessels includes economic losses or aesthetic impairment at harbors and marinas where vessels are abandoned; and physical damage to coral reefs associated with vessels that are not removed, begin to break apart, and/or release their cargo.

Question 2a. How many vessels are abandoned, with no owner to respond?

Answer. Thousands of vessels have been abandoned in U.S. waters. Based on surveys conducted in five of the seven U.S. coral reef jurisdictions (Guam, American Samoa, the U.S. Virgin Islands, Puerto Rico, and the Commonwealth of Northern Mariana Islands), over 200 of these vessels pose significant threats to coral reef ecosystems. Most of these are smaller vessels (those less than 50 meters in length).

In many cases, a derelict vessel equals a derelict owner. If the owner doesn't have sufficient funds to maintain the vessel, it is unlikely the owner would have the funds to properly dismantle and dispose of the vessel. In general, tracking down the owner is difficult. A vessel may be sold several times before it is ultimately abandoned, which makes it difficult to identify the responsible party.

Question 2b. Which agencies could be part of the solution, and what could their roles be?

Answer. The U.S. Coast Guard is engaged when abandoned vessels present a threat to navigation or could result in pollution. The Army Corps of Engineers could engage when vessels are abandoned in navigational channels. The Environmental Protection Agency is responsible for issuing ocean disposal permits. Additionally, any Federal or state property/land manager would be responsible if a vessel comes ashore (for example, the Department of the Interior if the vessel comes ashore in a national seashore; NOAA if the vessel is within a national marine sanctuary).

Question 2c. What existing authorities and funds are available, and what new authorities would be needed? Are there any models we can turn to?

Answer. Clear legal authority is needed to remove and properly dispose of abandoned vessels. Emergency authority is required to remove a vessel before it breaks apart, while it is less expensive to remove, and while it may still have some value. Funding sources are fragmented and depend on location, type of vessel, size, and type of threat (*e.g.,* the Oil Pollution Act applies only when the vessel has oil onboard, and the National Marine Sanctuaries Act applies only in designated sanctuaries). Many state laws are also limited in scope (e.g. only applying up to a certain tonnage or to certain types of vessels). Saipan is working on legislation that could be effective.

Question 2d. Could a public-private funding approach help to address this problem?

Answer. This is a possibility; the State of Washington has a potential model. Washington State provides funding to authorized county and port districts. However, the state only pays for a percentage of the cost, with local governments covering the remaining cost. The state levies a $2 tax on each boat registered, in order to fund this program.

Question 2e. Do you have an estimate of the cost of removal and response for the vessels we know about?

Answer. The cost of removal varies widely depending on logistics and size of the vessel. Costs vary anywhere from $10,000 to several million dollars for large vessels abandoned in remote locations.

Preventing Vessel Impacts on Coral Reefs

Question 3. While removal is a huge problem, it is far more cost effective to prevent future damage. In the Florida Keys National Marine Sanctuary, NOAA worked in collaboration with the Coast Guard to install radar transponder beacons to steer passing ships away from ecologically sensitive coral reef areas. Apparently, the beacons were purchased by the owners of a ship that went aground on a coral reef in the lower Keys as part of a damage assessment and restoration agreement. How effective are transponders in preventing ship collision and groundings on corals?

Answer. The transponders have no role in ship collisions, but can help reduce coral groundings. Since the radar beacons (RACONs) were installed in the Florida Keys National Marine Sanctuary (FKNMS), there have been no large ship groundings. There continue to be smaller vessel groundings (vessels <50 m), as small vessels often do not have the technology required to effectively use the beacons, and/or the operators do not know what they mean.

These RACONs have reduced the occurrence of groundings on coral reefs within the FKNMS. The RACONs provide unique all-weather radar beacon coverage of 360 degrees with a range of 15–25 nautical miles, and can respond to several hundred ships within their individual service area. The combination of a mandatory "Area To Be Avoided" (ATBA), enforcement of the ATBA, and the RACON beacons has meant no groundings of a vessel over 50 meters within the FKNMS since February 1997. Prior to that time there was at least one major event per year.

Question 3a. Could we take the same approach for coral reefs outside National Marine Sanctuaries? What are the barriers we would face?

Answer. Because different regions face different navigational concerns, an analysis of grounding events would have to be done in order to determine how many events would be preventable in another region, using this type of system.

The U.S. Coast Guard maintains the buoys and would need to approve the location of additional buoys, as well as agree to add these new buoys to their maintenance schedule. Funding to install and maintain the system could be a potential barrier.

Question 3b. Are there any "hot spots" in the Pacific, and particularly the Northwestern Hawaiian Islands, that could benefit from such transponders?

Answer. There are hot spots for grounded vessels in the Pacific, particularly at the major port areas such as Saipan and Apra Harbor in Guam. Some of these are due to storm related damage. Apra Harbor has a lot of visiting foreign fishing vessels and improved channel markings might be a potential way to reduce groundings.

The current investigation into the most recent grounding event in Pearl and Hermes Atoll may answer this question. At this time, it is unclear whether improved aids to navigation would have helped prevent this recent grounding.

Question 3c. How much do beacons and transponders cost to install and operate?

Answer. According to the U.S. Coast Guard, each unit currently costs $36,435, and $1,000 per year per unit to maintain. Using the beacons in areas where navigational platforms do not already exist would require additional cost to install these platforms.

Question 3d. Do you believe industry and non-governmental organizations could work with the government to help solve this problem, either through donations or through in-kind contributions? Are there any models we can look to?

Answer. Without establishing liability or additional regulation, industry incentive to participate in a voluntary system or to make donations is not likely. Most companies make donations as a form of marketing; their customers learn of their good deeds and increase their business with the company. However, shipping lines do not generally have the public as their customers. Their customers are corporations; therefore, they may not be as concerned about donation-type public relations efforts and would not have the incentive to voluntarily contribute.

For smaller vessels, NGO's representing recreational boaters may be able to provide incentive for these boaters to avoid vessel impacts to coral reefs. There is also a potential role for NGO's, or states, that have an interest in using abandoned vessels as artificial reefs.

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. BARBARA BOXER TO TIMOTHY R.E. KEENEY

Question. Your testimony emphasizes the successes of the Federal Ballast Water Technology Demonstration Program. Why did the Administration request zero funding for this in the Fiscal Year 2006 budget?

Answer. The President's Fiscal Year 2006 Budget Request reflects the current fiscal climate. Because of the large number of competing priorities, not all programs can be funded. However, the Administration agrees that aquatic invasive species are a complex and pressing problem, and continues to include funding for this issue within the overall budget request. The President's Fiscal Year 2006 Budget Requests includes $7.9M to continue NOAA's valuable work to prevent invasive species through programs such as the Aquatic Invasive Species Program, Sea Grant, the Great Lakes Environmental Research Lab, and National Centers for Coastal Ocean Science. Based on the history of their past projects, these programs will likely support some ballast water technology demonstration activities in Fiscal Year 2006.

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. FRANK R. LAUTENBERG TO TIMOTHY R.E. KEENEY

Question. Although the coral legislation on today's agenda does not deal with deep sea coral, it is equally in need of protection. How do you believe the protection of deep sea coral habitats would affect populations of the many species that depend on them for feeding and refuge?

Answer. Deep sea corals create habitats of exceptional biological diversity. Along with sponges, deep sea corals represent important 3-dimensional vertical relief, providing substrate for invertebrates and spawning, refuge and foraging areas for fishes. In a number of cases, deep sea coral habitats have been identified as essential fish habitat for federally-managed fisheries species. Currently, the principal threat to deep sea coral habitats is damage by fishing gear, especially mobile bottom-tending gear such as bottom trawls and dredges. Research conducted by NOAA has also documented impacts by deep-set gill nets, bottom long lines, and crab pots in U.S. waters. Other potential threats include impacts associated with activities that may disrupt bottom habitat such as oil and gas exploration and drilling, mineral mining, and installation of communication cables. As many deep sea corals are slow-growing, recovery of habitats from damage is likely to be very slow.

The President's Ocean Action Plan has recognized the importance of protecting deep sea coral habitats. NOAA is actively working with each of the Regional Fishery Management Councils to address concerns of fishing impacts and encourage protection of deep-sea corals when developing and implementing regional fishery management plans. Within the last year, NOAA has approved the recommendation of the New England Council to close two undersea canyons to trawling for monkfish, and a Record of Decision on the North Pacific Council essential fish habitat environmental impact statement that includes approximately 280,000 square nautical miles of ocean off-limits to bottom trawling, in part to protect deep sea coral habitats.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. DANIEL K. INOUYE TO REAR ADMIRAL THOMAS H. GILMOUR

Removing and Responding to Vessel Groundings on Coral Reefs

Question 1. You were very involved a few years ago in obtaining Federal assistance to remove 9 abandoned vessels from Pago Pago harbor, which had been driven onto the reef, and were responsible for both polluting the waters and crushing the coral resources. It was extremely hard to find a responsible program or funding needed to address the problem, but through persistence, you were able to leverage the help of both NOAA and the Coast Guard. Could you describe the scope of the problem today, including the various threats they pose?

Answer. The conditions that allowed, for example, the vessels in Pago Pago Harbor to be abandoned continue to exist today. With the exception of some barges covered by the Abandoned Barge Act, there is no U.S. Federal law that expressly prohibits the abandonment (i.e., stranding, wrecking, sinking, or leaving) of a vessel, including as part of search and rescue operations. The Coast Guard and other Federal, state, and local agencies continue to deal with the threats posed by abandoned vessels on a case-by-case basis. The threats posed include pollution threats from onboard petroleum and hazardous materials (paint, ammonia, *etc.*), and the physical damage by the hull to subsurface structures or marine organisms. Rusting vessel hulls may also increase the concentrations of metals in the surrounding waters and affect marine organisms and marine coral in particular. EPA and MARAD are developing guidance recommending environmental best management practices for preparing a vessel for use as an artificial reef. That guidance addresses these and other environmental concerns.

Question 1a. How many vessels are abandoned, with no owner to respond?

Answer. The U.S. Coast Guard last tracked abandoned vessels (in all locations) nationwide in 1999, and reported 3,031 abandoned vessels at that time.

Question 1b. Which agencies could be part of the solution, and what could their roles be?

Answer. The U.S. Coast Guard can remove or destroy a vessel if it pollutes the environment or poses a substantial threat to pollute. The U.S. Army Corps of Engineers can remove vessels that are abandoned within, or endanger, a Federal navigation channel. States and localities may have laws against abandonment of property and mechanisms to remove such property. The Department of Commerce and the Department of the Interior often assist the Coast Guard in identifying the type and extent of pollution threats posed by vessels and any nearby threatened or endangered species. If the abandoned vessel were to be towed out to sea for disposal, then

the Ocean Dumping Act, which is administered by the Environmental Protection Agency, would apply.

Question 1c. What existing authorities and funds are available, and what new authorities would be needed? Are there any models we can turn to?

Answer. Existing authorities for vessel removal or destruction for the U.S. Coast Guard come from the Federal Water Pollution Control Act (FWPCA) for petroleum threats and from the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) for hazardous material threats. Both FWPCA and CERCLA have available funds to remove pollution or pollution threats, including the entire vessel if necessary. The U.S. Army Corps of Engineers uses existing agency funds to remove Federal navigation obstructions. Possible new authorities may include a Federal law to make vessel abandonment illegal, requirements for adequate and binding pollution insurance for all U.S. vessels, and foreign vessels in U.S. waters. International pollution insurance requirements may also be sought via the IMO. Models that may serve as examples include the FWPCA and CERCLA laws where a particular community or commodity is taxed to provide removal funds for irresponsible owners.

Question 1d. Could a public-private funding approach help to address this problem?

Answer. Yes, a public-private funding approach could help address this problem, but an optimal solution would be to hold vessel owners directly responsible.

Question 1e. Do you have an estimate of the cost of removal and response for the vessels we know about?

Answer. From past actions, the cost to remove pollutants alone from a vessel can run into hundreds of thousands of dollars. Costs to remove a grounded vessel may run from hundreds of thousands of dollars to over a million dollars per vessel. Larger vessels normally contain more petroleum and hazardous materials, and thus are generally more costly to clean and remove.

Preventing Vessel Impacts on Coral Reefs

Question 2. While removal is a huge problem, it is far more cost effective to prevent future damage. In the Florida Keys National Marine Sanctuary, NOAA worked in collaboration with the Coast Guard to install radar transponder beacons to steer passing ships away from ecologically sensitive coral reef areas. Apparently, the beacons were purchased by the owners of a ship that went aground on a coral reef in the lower Keys as part of a damage assessment and restoration agreement. How effective are transponders in preventing ship collision and groundings on corals?

Answer. Radar beacons (RACONs) would not materially add to preventing ship collisions or groundings on coral reefs. RACONs are designed for the following applications:

- Ranging and identification on inconspicuous coastlines.
- Identification of aids to navigation.
- Indicating navigable spans under bridges.

RACONs are an aid to navigation; one of many types that make up our aids to navigation system. With reefs marked on navigational charts (both electronic and conventional), current buoyage, combined with Global Positioning System (GPS) navigation, RACONs would be of limited utility. RACONs merely serve to identify which radar return on a vessel's display is a specific aid to navigation. Used in conjunction with prudent navigation, they can be an effective tool in an area where it is difficult to discern the aid to navigation from other radar returns, but they do not take the place of proper navigation of a vessel.

Question 2a. Could we take the same approach for coral reefs outside National Marine Sanctuaries? What are the barriers we would face?

Answer. By themselves, RACONs would not prevent ship collisions or groundings. RACONs merely serve to identify which radar return on a vessel's display is a specific aid to navigation. Used in conjunction with prudent navigation, they can be an effective tool in an area where it is difficult to discern a single aid to navigation from another radar return, but they do not take the place of proper navigation of a vessel. To have utility, an entire buoy network would be necessary; however, the cost to establish a buoy network, especially with RACON, would be cost prohibitive.

Question 2b. Are there any "hot spots" in the Pacific, and particularly the Northwestern Hawaiian Islands (NWHI), that could benefit from such transponders?

Answer. There are no "hot spots" in the Pacific, nor in the Northwestern Hawaiian Islands (NWHI) which support the need for a RACON (please note that the term "transponder" is not associated with the U.S. Aids to Navigation system). There is

no recent history of vessel groundings, and the NWHI are not within primary shipping lanes, and have no primary shipping channel passages.

There are no RACONs or buoys presently in the NWHI, and current data does not support the need for buoys/RACONs in the NWHI. To establish a buoy network across the NWHI chain, especially with RACON, would be cost prohibitive.

Question 2c. How much do beacons and transponders cost to install and operate?

Answer. USCG estimates that the cost for a RACON is $36,435.00, $750.00 is allocated within the Budget Model annually for maintenance of each RACON.

Question 2d. Do you believe industry and non-governmental organizations could work with the government to help solve this problem, either through donations or through in-kind contributions? Are there any models we can look to?

Answer. There are mechanisms in place to work with industry and non-governmental organization. However, from a navigational perspective, and from the perspective of the donor, current data does not support the need for RACONs or buoys within the NWHI. There is no recent history of vessel groundings, and the NWHI are not within primary shipping lanes and have no primary shipping channel passages. More to the point, the NWHI chain is thousands of miles long and the cost to establish a buoy network, especially with RACONs, would be cost prohibitive. If a need for aids to navigation within the NWHI were established, the Commandant of the Coast Guard is authorized to accept aids to navigation as a gift pursuant to the provisions of 14 U.S.C. 93.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. BARBARA BOXER TO REAR ADMIRAL THOMAS H. GILMOUR

Question 1. Your written statement indicates that the standard the U.S. sought in the IMO negotiations was based on a sound scientific foundation. Didn't the U.S. delegation seek a standard that was 1,000 times stronger than what was adopted in the IMO treaty? Please describe what the IMO standard would achieve, compared to the standard that the U.S. sought in negotiations, and compared to the standard in S. 363 and S. 1224, relative to untreated ballast water that has not gone through ballast water exchange.

Answer. Yes, the U.S. negotiating position at International Maritime Organization (IMO) for zooplankton was for a standard of less than $0.01/m^3$, which would have been 1,000 times stronger than what was adopted under the IMO Standard which is less than $10/m^3$. S. 363 (Feb. 10, 2005 version) and S. 1224 call for less than $0.1/m^3$.

The rationale behind the development of the U.S. negotiating position at IMO was that ballast water treatment must result in a substantial reduction in the concentrations of organisms compared to untreated ballast water, specifically with respect to coastal organisms which can impact coastal ecosystems.

The IMO Convention standard represents a reduction in concentration of zooplankton from the median observed value for unmanaged ballast, but not a substantial reduction of phytoplankton for unmanaged ballast. The standard in S. 363 represents a more significant reduction for zooplankton and phytoplankton than the IMO standard.

The purpose of treatment of ballast water to a standard was to achieve greater reduction of risk than that presented by ballast water exchange, because of the wide variety of efficacy achieved by exchange, and certain vessels cannot complete an exchange either based on route or vessel characteristics, or both. All of the numeric standards under consideration would be an improvement over ballast water exchange in that they would provide more consistent reductions in organisms in ballast water.

Question 2. Isn't it consistent with the treaty for the U.S. to adopt a more meaningful and effective domestic standard, since the treaty specifically contemplates this by providing that countries may adopt "more stringent measures" than those of the treaty?

Answer. Yes, there is a specific provision in the Convention for the Control and Management of Ship's Ballast Water and Sediment (2004), which recognizes the sovereign right of a party to adopt more stringent measures to protect its waters, consistent with international law.

Question 3. How many countries have ratified the IMO treaty to date?

Answer. As of June 15, 2005, no country has ratified the IMO Convention for the Control and Management of Ship's Ballast Water and Sediments, but the following eight member governments have provided documents expressing their intent to ratify:

Argentina
Australia
Brazil
Finland
Maldives
Netherlands
Spain
Syrian Arabic Republic

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. FRANK R. LAUTENBERG TO JOEL C. MANDELMAN

Question 1. How much does your ozone ballast water treatment system cost, and how soon do you think we can require ships to carry them?

Answer. The cost will vary depending on the size of the ship and, most importantly, on the speed with which the ballast water comes onboard the ship.

The flow rate is critical. The faster the ballast water comes onboard, the greater the quantity ozone that will be required. The *Tonsina* and *Prince William Sound* (the BP oil tanker on which the current, final stage testing is taking place), are 125,000 dead weight ton oil tankers. Both ships take on ballast water at approximately 15,000 gallons per minute. This requires ±5,000 grams of ozone per hour to treat their ballast water—approximately 12 million gallons.

Smaller cargo freighters typically take on ballast water at a much slower rate. In some cases, such as the Navy's new Lewis & Clark class of freighters (50,000 DWT ships), they take on ballast water at a flow rate of only 4,500 gallons per minute. This will require significantly less ozone to treat even the same quantity of ballast water (and, typically, they would carry far less ballast water than a tanker).

Hence, the cost of the ozone generating equipment, and, possibly the installation cost, will drop sharply. What we do not yet know is whether that decrease is fully proportional to the flow rate of the ballast water. We expect that we will know this after completion of this series of tests.

We also expect that once the use of ballast water treatment equipment is mandatory—and there is a significant increase in demand—this equipment will be manufactured on a production line basis further cutting the cost. Therefore, it is difficult to estimate the precise cost of outfitting any given ship at this time. However, we estimate that this will likely be less than ½ of 1 percent of the total cost of building a ship, *i.e.,* less than $750,000—but this is only an estimate.

We believe that our equipment should be available for general purchase by the shipping industry within 6 months of passage of the Ballast Water Management Act.

Question 2. Your ozone treatment system kills organisms in ballast water. Are there any potential negative environmental effects of this treatment on the marine environment outside the ship? You have indicated that the ozone breaks down quickly after released into the ocean. What studies have been done on impacts before it breaks down?

Answer. A formal study, funded by NOAA, has just been completed. It is entitled *Ozone Treatment of Marine Ballast Water: Formation and Decay of Total Residual Oxidant.* It is co-authored by Dr. William Cooper, Professor of Chemistry of the University of North Carolina-Wilmington; Professor J. Hans Van Leeuwen, Professor of Civil and Environmental Engineering at Iowa State University; and Jack Perrins and Dr. Russell Herwig of the University of Washington.

This paper has been submitted for peer review to the Marine Pollution Bulletin and publication is expected next year. I have submitted a PDF file with the completed paper, in a separate e-mail. (This publication can be found at *http://www.nutech-o3.com/files/peer_mpb.pdf.*)

Ozone will have no residual impact if it is used to treat fresh ballast water. There are no residual chemicals. Ozone disintegrates in a few minutes, in fresh water, and it turns back into oxygen. Thus, all that would be discharged into the Great Lakes, for example, would be oxygen-rich-clean ballast water which is a major boon to improving water quality.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. BARBARA BOXER TO KATHY J. METCALF

Question 1. Does it really over-burden your industry that the standard in S. 363, and in S. 1224, is stronger than the IMO standard, since the bills also include a feasibility review of technologies prior to requiring industry to comply with the standards?

Answer. It is not a case of over-burdening the industry. Establishing a performance standard that does not correlate in some way to technological feasibility will need to be changed to reflect reality. While this is precisely the purpose of the feasibility review as contained in the bills, it is of great concern that establishing an unachievable standard could well catch the regulated community in an unintended "no win" situation should the standard not be timely amended if technology is not capable of achieving it as scheduled. There is also some benefit at least at the "first shot" of adopting the IMO standard as a sign the U.S. is willing to be a part of creating an international system. If technology is later shown to achieve a more stringent level, then the U.S. can simultaneously go back to IMO and propose revision of the IMO standard while at the same time amending legislation/regulation to make the national standard more stringent, regardless of whether IMO agrees to changing the standard at the international level (note: IMO Convention provisions that allow a country to adopt more stringent standards. Having noted these reservations and making a big assumption that "adjustment" of the standard based on available technology (up or down, the latter not being included in the draft legislation) will be done in a timely manner, then the standard can be set anywhere from millions to zero, since this review should result in an adjusted standard that reflects technological achievability at the time required by statute or regulation.

Question 2. Wouldn't it make more sense from an industry stand-point to require a stronger standard, since the alternative would be to require retrofits later on if the initial technology proves to be ineffective?

Answer. In my opinion, these are two separate issues. The standard needs to be set based on technological achievability. Retrofit requirements for existing ships should take into account a reasonable rate of return on the substantial investment of installing a ballast water treatment system. In surveying our members, typical amortization schedules for shipboard equipment/systems use anywhere between 7 and 15 years, so establishing a retrofit requirement which required a vessel to upgrade its existing treatment system to a new standard every 10 years would seem reasonable from a cost/benefit perspective. With regard to the question posed, establishing an unachievable standard does nothing to provide fewer impacts on industry, whether it relates to initial treatment system installation or retrofits, and thus, the standard should be set based on technological achievability.

Question 3. Why should the U.S. not adopt the most environmentally sound standard, as we did in the case of our double-hull requirements for the Oil Pollution Act, since the IMO standard is weak and we don't know if it will ever be in force?

Answer. Agree in part and disagree in part. Agree that the U.S. should adopt the most environmentally sound standard technologically achievable. However, we do not yet know what that standard is, and thus, setting a very stringent standard without regard to practical achievability makes no logical sense. With OPA 90, we knew that double-hulls could be constructed, the principle issue there was with the cost associated with implementing the provisions (on a per vessel), and in an orderly fashion (on an global industry basis) to ensure sufficient hulls to meet the demand for petroleum transportation. Disagree also with the comment that the IMO standard is weak . . . based on preliminary data we have seen from a number of test worldwide, 10 organisms is a very challenging level to meet. Disagree also with the concerns that the IMO standard may never be in force . . . even if it is never in force (which I doubt), the U.S. can establish the standard in domestic legislation and then ratchet it down as technology shows the ability to reach even lower concentrations.

Question 4. I understand that the tug and barge industry may have concerns about the safety of conducting ballast water exchange. Doesn't the safety exemption included in S. 363, and S. 1224 adequately address this concern?

Answer. First, I would like to direct attention to the American Waterways Operators written comments submitted to the record for the June 15, 2005 hearing. These comments fully explain the concerns by this industry relative to the conduct of ballast water exchange on tug/barge units.

In the opinion of CSA, the general safety exemption does cover the tug/barge concerns. However, this and other draft legislation, have included provisions that subject a vessel which claims the safety exemption more often than a predetermined

frequency, *e.g.,* one draft included a trigger of more than twice in six voyages to a more intensive port state control review. While this is justifiable in some cases, in the case of a tug/barge unit, invoking the exemption will be justified most, if not all, of the time. One possible alternative relative to a blanket exemption, would be to craft legislative text which empowers the USCG to grant the safety exemption to certain types/classes of vessels on an ongoing basis. It should also be noted that the request for the exemption was for exchange only.

Question 5. Isn't it true that some tug and barge operators have in fact been able to undertake ballast water exchange?

Answer. Yes, one operator of which we are aware is currently conducting exchange on specialized tug/barge units, a feat which is made possible (not without some safety concerns) by the semi-permanent connecting mechanisms between the tug and barge unit. We know of no operators that are conducting exchange on "traditional" tug/barge units, *e.g.,* towing behind or pushing ahead.

Question 6. Does the IMO treaty exempt this class of vessels from the ballast water exchange requirements?

Answer. No, the IMO treaty does not exempt this class of vessel for a variety of reasons discussed during negotiations at the Conference. The first, included in (D) above, was the recognition that the general safety exemption would cover such a case. The second, equally on point, was that the most tug/barge operations are generally contained within the EEZ of a single country, and thus, individual countries could create their own program for these "domestic" voyages without violating any provisions of the Convention.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. FRANK R. LAUTENBERG TO KATHY J. METCALF

Question 1. The ballast water treatment standards in this bill will take years to implement even after it becomes law. During this period of years, states would not be allowed to apply their own standards. Would some states see an erosion of their ballast water treatment standards during this time?

Answer. Yes. If the states enact/promulgate a quantitative ballast water discharge standard earlier than the implementation schedule as contained in the bill (which is consistent with the IMO Convention). It is difficult to comprehend on what basis the states would set this standard , particularly with regard to environmental benefit and technological achievability (See more details in third paragraph below). It would neither benefit the environment nor facilitate the continuation of maritime trade if a state created an unachievable standard. It is instructive to note that Ms. Maurya Falkner (Ballast Water Program Manager for the State of California) has stated that the IMO discharge standard permits higher concentrations of organisms than the concentrations found currently in California water; however I have not seen any data which confirms this statement, and thus, it may be prudent for the Committee to contact her and solicit her opinion on the question above.

While the states would certainly be the best source for the response to this question, I am pleased to provide the industry perspective. First, at this point in time, there is no state of which I am aware that has actually proposed a quantitative ballast water treatment/discharge standard. The State of Michigan has now promulgated regulations that will require a vessel to secure a discharge permit beginning, I believe in mid 2006, but has not provided any information concerning the discharge standards on which the permit will be based. Other states which currently have ballast water management requirements base these requirements on a required action by the vessel, *e.g.,* exchange in waters "X" nautical miles offshore and a minimum of "X" meters in depth.

Looking forward, I would expect some states to incorporate a discharge standard in future requirements; however, it is difficult to conceive the basis on which these standards would be based for two reasons. First. The global scientific community agrees that there is insufficient knowledge to assert that a particular discharge standard will reduce the risk from invasives to a predetermined level. What we do know is that reducing the concentration of organisms in the ballast water discharge will reduce the risk. Second, integrating operational reality into the scientific equation, the IMO standard is the "best guess" as to what is achievable in the near and medium term. Currently, a number of shipboard technology tests are underway around the world, and as yet, none have shown the ability to reach even the IMO standard as determined at the July 2005 meeting of the IMO Marine Environment Protection Committee meeting, at which a technology review was conducted as per the requirements of the IMO Ballast Water Convention. It was agreed at this meeting that it was likely that some technologies would be able to meet the IMO stand-

ard by the Convention implementation dates (beginning in 2009) for some classes of ships. Another technology review will be conducted at the Fall 2006 meeting of the MEPC to assess technology availability with regard to developments and data generated by studies currently in process.

Question 2. S. 363 already includes a provision to exempt ballast water exchange in unsafe conditions. Why is a specific exclusion for barges necessary?

Answer. A specific provision for barges is not absolutely necessary since these situations are presumably covered under the existing safety exemption as contained in S. 363. However, in my opinion, it will always be unsafe for a tug towing a barge to come "off the hawser" and move around alongside the barge, and then attempt to transfer a crew member from the tug to the barge. It should be noted that even in "normal" sea conditions, we are likely looking at 3 to 6 foot seas (swell) acting upon two independently floating objects, making the transfer difficult at best. Including a specific safety exemption for barges, removes the necessity of the Coast Guard having to review these circumstances every time they claim the exemption (which is likely to be quite frequent), and allows the Coast Guard to focus more properly on self-propelled vessels which invoke the safety exemption for reasons less obvious than that found in the case of tug/barges.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. DANIEL K. INOUYE TO KIM HUM

Community-Based Approaches to Coral Protection

Question 1. What are the top threats to corals in the Pacific, both in the main Hawaiian Islands and beyond?

Answer. Commercially, valuable reef fish in the main Hawaiian Islands have declined by 75 percent over the past 100 years due to a combination of over-fishing and habitat degradation due to invasive species and polluted runoff (from development, aging sewage systems and treatment facilities, and channelized streams). In addition, throughout the Pacific, the effects of natural disasters (such as tsunamis) on coral reef health have been magnified due to climate change and associated diseases and bleaching events which often stress corals beyond their ability to recover.

Question 2. How much have NOAA and its partners been able to achieve through the funding provided under the Coral Reef Conservation Act of 2000?

Answer. Funding under the Coral Reef Conservation Act (CRCA) has significantly increased our understanding of the health and distribution of coral reefs in Hawaii and throughout the Pacific. However, more funding is needed for on-the-ground management to protect and restore coral reef ecosystems, and to build capacity within state and local governments, and local communities throughout the Pacific.

NOAA programs funded under the CRCA have focused on research, monitoring and mapping, and provided valuable data about the habitat in which we are working throughout the Pacific. In addition, significant CRCA funding has ensured that the proposed Northwest Hawaiian Islands Sanctuary designation process has been thorough and effective.

However, additional funding is critically needed for capacity building and on-the-ground marine conservation projects, especially those involving the human communities associated with the coral communities we are trying to protect. NOAA provides approximately $400,000 annually to the State of Hawaii for coral reef protection, and similar amounts to the territories throughout the Pacific. Hawaii and the territories are dependent upon this funding for core programs, and require additional funding for reef protection projects that will actually begin to address the primary threats to the ecosystem.

In addition, NOAA has provided $125,000 annually from the CRCA to The Nature Conservancy's Hawaii Program, which has enabled us to start a marine program focused on: (1) identifying the most important coral systems in the main Hawaiian Islands, (2) working with local communities to begin managing these important coral reef systems, and (3) developing sustainable private financing mechanisms to ensure the long-term viability of coral reef protection programs in the islands. Additional funding for public and private conservation projects in the Pacific would enable us to leverage more private dollars, and significantly increase the private sector's ability to address coral reef protection issues throughout the region.

Question 3. How well have the Federal and state agencies coordinated and cooperated with local groups to address these threats in the Pacific? Do you have any recommendations for improvement?

Answer. There is excellent coordination between NOAA and the private non-profit sector in Hawaii. Cooperation between the state Department of Land and Natural

Resources (DLNR) and NOAA, and the state and the private sector is also improving. However, there is always room for more and better cooperation and communication.

In addition to the national planning and cooperation necessary for successful protection of our Nation's reef resources, NOAA should be given the authority to coordinate with states, territories, and NGO's for regional, ecosystem-based planning that builds upon the National Coral Reef Action Strategy, and addresses multiple threats to coral reefs, such as over-harvesting, coastal runoff, invasive species, and vessel impacts. This authorization would go a long way toward encouraging more meaningful cooperation and partnership in coral reef protection throughout Hawaii and the Pacific.

In addition, the Fish and Wildlife Service (FWS) is responsible for managing more than 700,000 acres of coral reefs in 10 refuges throughout Hawaii and the Pacific, with minimal funding from the Department of the Interior. Therefore, interagency cooperation between FWS and NOAA is essential to successful implementation of the strategies outlined in the CRCA and the Coral Reef Action Strategy, and all of the agencies that are responsible for coral reef management should be eligible for funding under the Act, including Interior agencies such as the FWS and Office of Insular Affairs.

Mechanisms for interagency cooperation, like the Coral Reef Task Force, should be supported through the CRCA, and include national and international NGOs, such as The Nature Conservancy, which bring a unique perspective and global experience to coral reef conservation.

Question 4. What do community-based approaches bring to the table that the Federal programs alone do not? What do the Federal programs provide that community-based approaches cannot?

Answer. The Federal agencies clearly have the expertise to provide scientific research, biological surveys and monitoring, mapping, and a nationwide network of experts to draw from for coral reef conservation in Hawaii and throughout the Pacific. Their work complements, supports, and is supported by the work of local governments, NGOs, and communities who have knowledge and expertise in local resource issues.

For example, many local, coastal communities in Hawaii are interested in managing the coral reef resources surrounding their communities. NGOs like The Nature Conservancy are working with them through a new program with the state DLNR called "*Makai*[1] Watch" to build their capacity to provide: (1) outreach and education to resource users so that they know the laws and local best practices (*e.g.,* seasons and size limits, how to interact with marine mammals, where they can and cannot throw net, etc); (2) surveillance and enforcement to ensure that laws are being followed; and (3) human use surveys and biological monitoring to understand the threats to reef resources, and the biological effects of those threats on the coral reef communities. Because they live adjacent to the resources, local communities can provide a level of management and enforcement which no government agency could ever provide. However, in order to be effective and durable, their work must be informed by public and private partners who bring good science, an in-depth understanding of marine biology, authority for the laws governing the use of local resources, and lessons learned from other communities around the world.

Question 5. Do you believe community-based approaches can fill some of the remaining gaps in coverage? If so, which ones?

Answer. The biggest gaps in reef resource protection are (a) the designation, and management of a resilient, scientifically-designed network of marine managed areas (MMAs) that ensures the future health of our coral reefs and associated reef species, and (b) enforcement of that system. Community support is essential both for developing a system of MMAs, and managing and enforcing it. Our goal is to work with local communities, the fishing community, and other stakeholders to ensure that a network is designed and implemented which supports their goals of sustainable fisheries and protected resources.

The local community will play an even greater role in ensuring that the network and the resources within that network are protected through the Makai Watch program as outlined above. Outreach is key to ensuring that marine resource users (fishermen, collectors, kayakers, *etc.*) understand the laws and rules governing their use of the resources, and communities can play a primary role in providing that outreach. Enforcement is the other key to sustainable resource protection, and while that is primarily a state role, there are not enough enforcement officers to ensure local compliance with resource protection laws. Because they live adjacent to the re-

[1] *"Makai"* is Hawaiian for "towards the sea."

sources, concerned community members can serve as the eyes and ears of law enforcement to ensure that the resource is truly protected.

Question 6. Is there strong interest in increasing public-private approaches to solving coral reef problems?

Answer. Yes, there is very strong interest at all levels in increasing public-private approaches to solving coral reef problems. It is clear that no one agency can manage and protect reef resources in Hawaii or anywhere in the Pacific. It takes the scientific expertise of the Federal Government, the regulatory authority of the state government, the international experience of the NGO's, and the knowledge and expertise of the local communities to provide all of the skill sets necessary for such a big job. The state is, understandably, concerned about communities wanting to take control of reef resources for their own use to the exclusion of others. But the resources belong to everyone, and it is our collective responsibility to ensure that they are managed properly to ensure that everyone is able to enjoy and use them, sustainably, for generations to come.

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. FRANK R. LAUTENBERG TO KIM HUM

Question. Although the coral legislation on today's agenda does not deal with deep sea coral, it is equally in need of protection. How do you believe the protection of deep sea coral habitats would affect populations of the many species that depend on them for feeding and refuge?

Answer. While The Nature Conservancy does not work on deep sea coral issues in the Hawaiian Islands, we recognize that they provide important habitat for several species of fish (including commercially important species such as cod, roughy, and sea bass), crustaceans, anemone, sponges, and other species off all U.S. coasts, and throughout the world. Protection of the deep sea corals which provide habitat for these species—many of which are disappearing from shallow water habitat—is essential for their continued survival.

While trawling is not a threat to the deep sea corals in Hawaii, it is the primary threat to deep sea corals elsewhere in the world, where trawlers have been pulling up colonies that are hundreds of years old. Some of the natural communities affected by trawling can be well over 1,000 years old. Because deep sea corals are so slow growing, recovery from such catastrophic damage can take decades to centuries. Recently, more than 1,100 scientists called for the protection of the world's deep sea coral and sponge ecosystems, and urged nations to place a moratorium on bottom trawling, saying "deep sea coral and sponge communities appear to be as important to the biodiversity of the oceans and the sustainability of fisheries as their analogues in the shallow tropical seas."

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. BARBARA BOXER TO MAURYA B. FALKNER

Question 1. What is the status of California's regulations on ballast water?

Answer. On June 20, 2005, the California State Lands Commission approved staff's recommendation to adopt permanent regulations titled "Ballast Water Regulations for Vessels Arriving at California Port of Places after Departing from Ports or Places within the Pacific Coast Region." The purpose of these regulations is to establish management practices for ballast water that is taken on by marine vessels in ports or places within the Pacific Coast Region and is to be discharged in a California port or place. This, in turn, would minimize the transport of nonindigenous species (NIS) in ballast water discharged into state waters. Staff is currently completing the Final Statement of Reasons and other associated paperwork for the rulemaking file and intends to submit the final package to California's Office of Administrative Law (OAL) by the end of July 2005. The OAL has 30 working days to review and act upon the rulemaking package. The regulations go into effect 180 days (6 months) after being filed with the Secretary of State.

A summary of the regulations and issues raised by the maritime industry is attached for your review (Attachment A).

Question 2. Does California's law exempt tug and barge operations?

Answer. No, the California Act does not exempt tug and barge operators. The Act does include an exemption provision for vessels of the armed forces that are subject to "Uniform National Discharge Standards for Vessels of the Armed Forces." Additionally, vessels in innocent passage are not subject to the Act. During the 2003 legislative session, the issue of exemptions for specific vessel classes was evaluated. It

was determined that there were no biological reasons to exempt specific commercial vessel classes from the law. Furthermore, it was and is hoped that in the near future, technology, either ship or shore based, will be developed for vessels unable to conduct ballast water exchange while underway. An exemption from the Act, or subsequent regulations for these types of vessels would likely dissuade vessel owners from pursuing alternative treatment options. However, the Act and CSLC recognize the design limitations of, and safety concerns associated with, these vessels and have included provisions to address these issues.

Question 3. Isn't it true in California that some tug and barge operators have in fact been able to undertake ballast water exchange?

Answer. Yes, according to data provided to CSLC on the mandatory reporting form, some barge operators have conducted ballast water exchange. However, the CSLC recognizes that this management option, under many situations may pose a serious safety issue for the crew. As such, the Act and the proposed regulations include provisions that address safety issues as well as severe hardship issues not related to safety.

ATTACHMENT A—SUMMARY OF PROPOSED REGULATIONS GOVERNING BALLAST WATER MANAGEMENT FOR COASTAL VOYAGES.

TITLE 2, DIVISION 3, CHAPTER 1

ARTICLE 4.6 BALLAST WATER REGULATIONS FOR VESSELS ARRIVING AT CALIFORNIA PORTS OR PLACES AFTER DEPARTING FROM PORTS OR PLACES WITHIN THE PACIFIC COAST REGION

The proposed regulations contain five sections of management requirements:

Section 2280 describes the purpose, applicability, and date of implementation;

Section 2281 describes the safety exemption;

Section 2282 defines several key terms used throughout the regulation;

Section 2283 describes the process for submission and approval of alternatives; and

Section 2284 describes the ballast water management options, which includes exchange in "near coastal waters."

The requirement to conduct ballast water exchange in "near coastal waters" that are at least 50 nautical miles (nm) from shore, was selected based on input received from the scientific community, maritime industries, and state and Federal Government management agencies during several workshops. These workshops were held to ensure that decision was founded upon the best scientific information available, while also considering concerns of affected industries. For most voyages, the 50 nm distance would require no course deviation for some vessels and a minor deviation for many. Exchange at 50 nm avoids ballast discharge in coastal "retention zones" and at the mouths of estuaries, where currents and tides can carry organisms to shore, or sweep them into bays and estuaries. The limit also lies beyond the boundaries of sensitive protected areas, such as Marine Sanctuaries. Further, the maritime industry requested that California's regulation be consistent with other U.S. state, Federal and international regulations, in order to avoid confusion that would occur should vessels encounter a patchwork of varying regulations as they traveled across jurisdictions.

Issues or Concerns: The Commission staff held two public hearings. The first on June 2, 2005, at the Port of Long Beach, and the second on June 8, 2005, at the Elihu M. Harris State Building, in Oakland. Two people presented oral statements relevant to the proposed regulatory action. In addition, Commission staff received ten comment letters relevant to the proposed regulatory action. The specifics of each comment will be addressed in the Final Statement of Reasons; however, a few concerns and comments have been repeatedly raised and warrant discussion here.

For the vast majority of commercial vessels that fall under this regulation, near-coastal ballast exchange will be the primary method of ballast water management. Currently, it is the best compromise of efficacy, environmental safety, and economical practicality. According to industry representatives, the vast majority of vessels are capable of conducting exchange, and the management practice does not require any special structural modification to most of the vessels in operation.

The shipping industry has expressed concern that a small minority of vessels and/or commercial shipping routes may be significantly impacted by the proposed regulations. Commission staff recognizes this possibility. These vessels and/or commercial shipping routes can be categorized in two ways. The first are vessels that, due to special safety circumstances, are unable to perform ballast water management as

described in Article 4.5, Section 2284 of the proposed regulation. For example, ballast water exchange as outlined in the regulations may pose a serious personnel safety concern for tugs and barges. Safely moving a crew from a small boat to a barge could pose a serious safety risk. To address this issue, a provision (Section 2281) is included in the regulation, ensuring that the safety of the vessel, its crew, or its passengers is not compromised by the management requirements specified in the PRC.

The second general concern relates to a minority of vessels, for which compliance with the proposed ballast water management requirements may present some hardship not related to safety. To address this issue, a petition process has been included in the rulemaking package that would allow impacted entities to present individual hardship cases and associated alternative ballast management proposals to the Commission. This section is necessary to provide flexibility for the Commission to consider special hardship cases from the maritime industry, and associated alternative management proposals, on a case-by-case basis, while providing a formal public notification and/or review process.

A third concern is related to the "shared water" designation. It has been suggested that the proposed regulations should include geographically-extensive shared-water designations similar to those used in Oregon and Washington. For example, for transits between Los Angeles and San Diego, and for voyages between the San Francisco Bay-Delta to Eureka, the industry has requested various relaxations to the requirement for exchanging ballast at locations 50 nm offshore and 200 m depth.

In consideration of these concerns, staff subsequently contacted several scientific experts, reviewed relevant scientific literature, and completed preliminary analyses to address the issue. In summary, the best available information strongly indicates that estuarine (bay/port) ballast water should not be transported between California ports, and this includes voyages between the specifically mentioned short-haul voyages.

- Natural transport of organisms between estuaries appears to be very low, in the absence of human activity.
- Short coastal voyages are more likely to transport organisms in good physical condition, maximizing chance for establishment in a new area.
- The San Francisco Bay estuary is one of the most highly invaded areas of the world, and is likely to act as a "hub" from which non-indigenous species can spread to other areas of California.
- Many non-indigenous organisms found in one of the aforementioned ports are not yet found in the other. The potential for their continued spread should be minimized.
- Some non-indigenous species in San Francisco Bay are clearly problematic or are found in very high numbers, and have not yet been found in Humboldt Bay. Examples include the Chinese mitten crab and the Asian clam.
- The region between San Diego and Point Conception is an oceanographic "retention zone" where water re-circulates for extended periods. These zones have the capacity to retain organisms released in them, and oceanographers have explicitly recommended avoiding ballast exchange in them.

Several commenters have suggested the inclusion of language stating that a vessel should not be required to deviate from its intended voyage or unduly delay its voyage to comply with ballast water management. The International Maritime Organization (IMO) has adopted recommended guidelines for this issue containing such language with regard to deviation and undue delay. Staff feels that, while the language may be appropriate for a negotiated international recommendation or guideline, it is wholly insufficient for a regulation that must meet the mandate of P.R.C. Section 71204.5. Staff has been unable to find any data with regard to compliance with the IMO guideline, but anecdotal evidence strongly suggests that the "undue delay and deviation" exemption is used readily, thereby rendering the guideline of little value. Without further contingencies and definition, a small deviation or minor delay in an intended voyage could easily be claimed, exempting those voyages and significantly weakening the ability of this regulation to effectively prevent or minimize the introduction and spread of NIS. One may consider analogous to a speed limit that prohibits driving over the posted speed ". . . unless it is inconvenient." The inclusion of the language, that would allow noncompliance in the event that it would necessitate deviation from an intended voyage or undue delay, puts the decision to comply entirely in the hands of the regulated community, not the regulatory agency. If there were a clear definition of an acceptable deviation or undue delay, it may be possible to craft an enforceable regulation. However, the

commenters suggesting the language have not provided such definitions. Therefore, protection of the state's waterways from nonindigenous species, as required under P.R.C. Section 71204.5, would not be assured if such a vague, undefined and lenient exemption were allowed. Additionally, it is believed that without sufficient definition, this language would not meet the "Clarity Standard" required in the Administrative Procedures Act. As an alternative, staff has included a petition process, under Section 2283, that would allow impacted entities to present individual hardship cases and associated alternative ballast management proposals to the Commission. If compliance with the regulation would clearly cause significant hardship, then the Commission and the affected operator could determine what course of action could be taken as an appropriate alternative to meet the mandate of the statute, while at the same time limiting or eliminating the hardship.

Finally, one commenter suggested that staff include in the proposed regulations, a provision requiring an evaluation of these regulations and their impact on the shipping industry, six to twelve months after their implementation. While staff disagrees with the need to include such a provision in the regulation, Staff does agree that the effectiveness of the proposed regulations should be evaluated on a regular basis. To that end, Staff recommends that the Commission direct Staff to review and evaluate the impact of the amendment on the regulated community 12 months after its implementation date, and report to the Commission on its findings. In addition, the Act already requires the Commission to evaluate, summarize, and report to the legislature and the public on the status of the Program, including the effectiveness of adopted regulations. This report is due biennially, with the next scheduled for January 2007.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. FRANK R. LAUTENBERG TO MAURYA B. FALKNER

Question 1. Although the coral legislation on today's agenda does not deal with deep sea coral, it is equally in need of protection. How do you believe the protection of deep sea coral habitats would affect populations of the many species that depend on them for feeding and refuge?

Answer. I do not have any expertise in deep sea coral or programs designed to protect them.

They have only recently been recognized as important habitat for several fish species, including a number of commercially-important species. They are long-lived (100s to over 1,000 years old) and extremely diverse. They are being threatened by a variety of fishing practices and oil exploration and extraction activities.

Coral protections will affect associated species populations positively. Through protection, associated populations numbers should remain stable because their habitat remains stable, new species should come to light through increased research funding, and commercial fisheries will also benefit from better understanding of deep ocean climate changes recorded in coral rings, which are the practical equivalent of tree rings on land.

I would suggest Committee members contact Peter Etnoyer of Aquanautix Consulting (*Peter@aquanautix.com*) and Lance Morgan (*Lance@mcbi.org*), or Elliott Norse (*Elliott@mcbi.org*) of Marine Conservation Biology Institute. Drs. Etnoyer, Morgan, and Norse have been involved in research on deep sea corals.

Additionally, information can be found at the following websites:

http://www.coris.noaa.gov/about/deep/deep.html.
http://www.mcbi.org/DSC_statement/sign.htm.

Question 2. You testified that vessels traveling short distances, but distances between two different estuaries, should still exchange ballast water offshore. These vessels, though, may have to go significantly out of their way to do this. Do you have a sense of how many vessels will have to significantly alter their course and be delayed by this process?

Answer. It is difficult to quantify the number of vessels or voyages that will ultimately be impacted by this new regulation. Based on comments the California State Lands Commission (CSLC) received before and during the formal public review period for the rulemaking package (see Attachment A "Final Statement of Reasons," which summarizes and responds to comments CSLC received during the initial notice period), most of the companies have advised us that they will be able to accommodate the proposed regulations with little difficulty. Only a relatively small percentage of the population of coastal traffic has stated that they will suffer dramatic economic consequences under the new rule. This issue will be further defined in meetings scheduled between the CSLC and the maritime industry in late October 2005. Currently, staff is aware of 15 vessels, out of the ~1,000 vessels that visit the

state annually that, due to their design or trade route, will be significantly impacted by the new regulation. Under the new regulation, these vessels may be accommodated by provisions of Section 2283, Alternatives. Such vessels may petition for an alternative to comply with the regulation.

ATTACHMENT A—FINAL STATEMENT OF REASONS

UPDATE OF INITIAL STATEMENT OF REASONS

As a result of the comments only one non-substantive change has been made to the text of the regulations. The word "or" in subsection 2284(a)(1) has been struck out in response to comment No. 4. No other modifications have been made to the proposed regulations. As such, there is no update to the Initial Statement of Reasons.

Summary and Response to Comments Received During the Initial Notice Period of April 13, 2005 Through June 8, 2005

Written Comments of Carlton D. Moore, CDFG, OSPR

Comment 1: Commenter believes that the proposed regulations provide a good starting point for controlling ballast discharges through exchange, but hopes that the provisions are revised as ballast water treatment technologies are developed that provide a higher level of protection.

Response: As currently drafted, the proposed regulation includes the option for ballast water management through approved ballast water treatment technologies. Section 2284(a)(3) permits a vessel to manage ballast water using a ballast treatment technology that is approved by the California State Lands Commission (CSLC).

Comment 2: Add language to Section 2280(c) that clarifies that there is another regulation in place that applies to vessels arriving to California from outside the Pacific Coast Region.

Response: The comment does not pertain to the proposed regulation, but to other existing requirements of the enabling legislation, Public Resources Code (P.R.C.) § 7204.2. The CSLC notes that vessels are obligated to comply with the requirements outlined in P.R.C. § 71204.2, which applies to vessels carrying ballast that originates from ports or places outside of the U.S. EEZ.

Comment 3(a–d): The California Department of Fish and Game (CDFG) requests that terms and processes in Section 2283, "Alternatives," be elaborated upon for clarification. Specifically, the commenter requests that more information on which practices can be adopted as alternative management options, steps a petitioner must take to navigate the petition process, the length of time the process will take, criteria that will be used to evaluate the merits of a proposed alternative, and if there may be an appeals process.

Response: The purpose for the provision is to allow for the flexible development of management alternatives for unusual and rare hardship situations that are deemed valid by the Commission (See ISOR). Through its frequent communication with the commercial shipping industry, the CSLC anticipates that petitions will be submitted by vessels, owners, or operators with unique difficulties and circumstances. Therefore, a specific list of allowable alternative management options was not directly included in the regulation so the range of management solutions would not be constrained. Second, the CSLC maintains open communications with the commercial shipping industry. Should a petitioner request, the CSLC intends to work directly with petitioners to develop biologically protective alternatives for submission to the Commission.

Comment 4: Correct apparent typographical error in Section 2284: "Exchange the vessel's ballast water . . . taken on in a port *or* place or within the Pacific Coast Region."

Response: Accepted. Text will be amended as suggested.

Comment 5: Add a section to the regulation that informs the regulated community of potential consequences for non-compliance.

Response: Consequences for non-compliance are currently included in the enabling legislation (Marine Invasive Species Act, P.R.C. § 71216 and § 71217). Including non-compliance language in the proposed regulation would be redundant. The entire regulated community is fully conversant with the statue.

Written Comments of Capt. Phil Davies, ChevronTexaco

Comment 6: Commenter states that ChevronTexaco has been a supporter of the Marine Invasive Species Program, and recognizes that ballast water exchange is an interim solution that will reduce the risk of invasive species introductions.

Response: The Commission thanks the commenter for their support, and notes that no response is required.

Comment 7: The commenter lists the five ballast water management options allowed by the proposed regulation and states that ballast water exchange is the primary method utilized by the majority of ship owners. The remaining management options are not possible for ChevronTexaco vessels due to operating schemes, lack of infrastructure, or lack of technological development.

Response: Ballast water exchange 50 nautical miles offshore is among the acceptable management options listed in the proposed regulation Section 2284. A vessel utilizing the method would be in compliance with the regulation. Thus, ChevronTexaco will be in full compliance should they choose to conduct ballast exchange. Vessels that are unable to conduct one of the five management options of Section 2284 due to issues not related to safety, may be accommodated by provisions of Section 2283, "Alternatives." Such vessels may petition for an alternative to comply with the regulation.

Comment 8: The proposed regulation does not make allowances for extenuating circumstances, which is inconsistent with related International Maritime Organization (IMO) agreements and U.S. Federal regulations, which do not impact commerce. Those regulations accommodate vessels that would be subject to delays or experience impacts to scheduling.

Response: The term "undue deviation and delay," used in the U.S. Federal regulation and IMO Convention and are not adequately defined, as no criteria for substantive deviation or delay is set forth. Additionally, the regulation must be developed pursuant to California statute. Vessels that are unable to comply with the proposed regulation due to issues not related to safety may be accommodated by provisions of Section 2283, "Alternatives." Such vessels may petition for an alternative to comply with the regulation. These may include cases of extreme financial hardship, provided that the petitioner includes all the data and information required to evaluate the merits of the petition, and that the proposed alternative fulfills the purpose of the proposed regulation.

Comment 9: The commenter states that, during a meeting in 2004, the CSLC estimated that less than 15 percent of vessels that will be required to exchange ballast water, will be unable to do so due to their short voyage duration or vessel design. The economic impact to these operators will be millions annually, though the reduction in the number of species transferred has not been quantified.

The commenter further states that the CSLC's intention with the alternatives petition process (Section 2283, "Alternatives") was to collect monies from vessel operators to perform a management practice other than ballast water exchange. Such an arrangement was not agreed upon during the development of the proposed regulation.

Response: Vessels that are unable to comply with the proposed regulation due to issues not related to safety may be accommodated by provisions of Section 2283, "Alternatives." Such vessels may petition for an alternative to comply with the regulation. These may include cases of extreme financial hardship, provided that the petitioner includes all the data and information required to evaluate the merits of the petition, and that the proposed alternative fulfills the purpose of the proposed regulation.

Several studies conducted on the efficacy of ballast water exchange have shown a 70–95 percent reduction in the number of organisms transferred in a ballast tank. See ISOR for the proposed regulation, "Information Relied Upon."

No fees will be collected in conjunction with Section 2283, "Alternatives."

Comment 10a: Consider that in order to conduct ballast water exchange 50 nm from shore, more vessels will move into tanker lanes and will cross other designated shipping lanes, increasing the risk of collision.

Response: The proposed regulation does not define routes by which vessels must travel in order to conduct ballast exchange. Theses regulations do not supersede the international navigational and ship handling standards found in the Convention on the International Regulations for Preventing Collisions at Sea, 1972, (Colregs). The only formally designated vessel traffic routing scheme exists on the Central and Southern California coast. This internationally recognized Traffic Separation Scheme (TSS) requires vessels using it to proceed in prescribed ways including methods for entering, departing, and crossing the TSS. Nothing in these regulations

would change those methods. Most of the TSS is closer than 50 nautical miles to the shore.

There is a voluntary agreement between the State (Office of Spill Prevention and Response of the California Department of Fish and Game) and operators of crude oil tankers in the Alaska trade (through the Western States Petroleum Association). The agreement includes a provision that those vessels will transit the California coast at least 50 nautical miles offshore. There are no prescribed routes or tracks that these vessels must follow. They must comply with the Colregs.

The Commission has no information supporting the contention that collisions are likely to increase if more ships are required to transit beyond 50 nm.

Comment 10b–c: Consider that under the proposed regulation, vessels that are not able to perform ballast water exchange will travel more slowly or stop in tanker lanes. Vessels that move at reduced speeds will be more difficult to maneuver and control, and will be a more vulnerable security risk.

Response: If a vessel is unable to perform ballast water exchange, it is not clear why it would be required to slow down or stop in tanker lanes. A vessel unable to conduct exchange may opt to perform one of the remaining four management options of Section 2284. Additionally, vessels that are unable to comply with the regulation due to issues not related to safety as defined in Section 2281, may be accommodated by provisions of Section 2283, "Alternatives." Such vessels may petition for an alternative to comply with the regulation.

Comment 10d: Consider that under the proposed regulation, vessels will be required to travel further distances to comply, increasing air emissions.

Response: This issue has not been studied carefully, but since these ballast water exchanges will take place greater than 50 nautical miles from shore, it is anticipated that air quality in California would not be affected.

Further, the Commission has no information supporting the conclusion that air emissions may increase or whether those increases would be significant. The Commission has no information supporting the contention that ships would have to slow down, nor is the information on where they might slow down. Whether, where, or how much air emissions may increase cannot, therefore, be determined.

Comment 10e: Consider that the proposed regulation will increase costs for the maritime industry, resulting in costs that will be passed on to consumers, and potential loss of business to the state.

Response: Vessels that are unable to comply with the regulation due to issues not related to safety as defined in Section 2281, may be accommodated by provisions of Section 2283, "Alternatives." Such vessels may petition for an alternative to comply with the regulation.

Comment 10f: Consider that Washington, Oregon, and British Columbia do not require ballast water management of vessels traveling wholly within their states. These states conform with the International Maritime Organization (IMO) and U.S. Coast Guard (USCG) agreements, and accommodate short voyages. The proposed regulation would be inconsistent with those of neighboring West Coast states, and will create voyage delays particularly for short voyages.

Response: The regulation must be developed pursuant to California statute, and thus, is not required to conform with regulations of other U.S. states or countries. Vessels that are unable to comply with the proposed regulation due to issues not related to safety may be accommodated by provisions of Section 2283, "Alternatives." Such vessels may petition for an alternative to comply with the regulation. These may include cases of extreme financial hardship, provided that the petitioner includes all the data and information required to evaluate the merits of the petition, and that the proposed alternative fulfills the purpose of the proposed regulation.

Comment 10g: Consider that the Oil Pollution Act of 1990 limits the number of hours seamen may work, and the proposed regulation will create financial hardship or transit delays.

Response: Most ballast water exchanges are not personnel intensive. The affect on the work hour limitations imposed by Federal statute will be different from vessel to vessel. Operators that are unable to comply with the regulation due to issues not related to safety may be accommodated by provisions of Section 2283, "Alternatives." Such operators may petition for an alternative to comply with the regulation. These may include cases of extreme financial hardship, provided that the petitioner includes all the data and information required to evaluate the merits of the petition, and that the proposed alternative fulfills the purpose of the proposed regulation.

Comment 11: The CSLC should make accommodations within the regulations for vessels that are unable to comply with the proposed regulations. The regulations as

written would place businesses in California at a disadvantage in comparison to other West Coast ports.

Response: Vessels are not required to comply with the proposed regulation under conditions that endanger a vessel, its crew, and its passengers. Vessels that are unable to comply with the regulation due to issues not related to safety may be accommodated by provisions of Section 2283, "Alternatives." Such vessels may petition for an alternative to comply with the regulation. These may include cases of extreme financial hardship, provided that the petitioner includes all the data and information required to evaluate the merits of the petition, and that the proposed alternative fulfills the purpose of the proposed regulation. See comments 15 and 18, and response thereto.

Written Comments of John Berge, Pacific Merchant Shipping Association (May 26, 2005)

Comment 12: The Pacific Merchant Shipping Association (PMSA) supported the renewal of the enabling statue, AB 433 (2003), supports the management efforts of the program, and recognizes that current regulations will reduce the risk of invasive species introductions until better technologies are developed to eliminate the risk.

Response: The Commission thanks the commenter for the comment and notes that no response is required.

Comment 13 and Comment 15: PMSA applauds the CSLC's effort to align the proposed regulation with aspects of the IMO and the USCG proposals. However, these other regulations make accommodations that the proposed regulation does not, for vessels that would be required to make extensive deviations or suffer delays. Failure to accommodate these vessels could result in financial hardship to the industry, and could eliminate some trade in California. Specifically, accommodation should be made for vessels in regular trade that cannot comply, and vessels that encounter irregular situations.

Response: The accommodations made for deviation and delay used in the U.S. Federal regulation and IMO Convention are not adequately defined, as criteria for substantive deviation or delay is not set forth. Vessels that are unable to comply with the proposed regulation due to issues not related to safety may be accommodated by provisions of Section 2283, "Alternatives." Such vessels may petition for an alternative to comply with the regulation. These may include cases of extreme financial hardship, provided that the petitioner includes all the data and information required to evaluate the merits of the petition, and that the proposed alternative fulfills the purpose of the proposed regulation. See comment 8 and 15, and response thereto.

Comment 14a: Consider that the efficacy of ballast water exchange at reducing invasive species transport has not yet been fully quantified.

Response: Though the exact numerical efficacy of ballast water exchange for removing organisms in tanks varies depending on vessel and voyage pattern, numerous studies have shown that the management practice reduces the number of organisms transferred in a ballast tank. See ISOR for the proposed regulation, "Information Relied Upon."

Comment 14b: Consider that the proposed regulation should reduce the risk invasive species transfer, even if a small number of vessels are accommodated.

Response: P.R.C. §71204.5 requires that the proposed regulation be ". . . designed to protect the waters of the state." This requires that the proposed regulation be protective, rather than merely reduce the risk of species transfer. Therefore, the small population of vessels that petition for an alternative ballast management option under Section 2283, "Alternatives," will be required to fulfill the purpose of the regulation.

Comment 14c: The supporting science in terms of risk factors is still not well established.

Response: The majority of research experts, and peer-reviewed scientific literature on marine and estuarine non-indigenous species generally agree that ballast water is likely the largest vehicle by which invasions have occurred. This recognition is reflected in existing ballast water regulations or conventions adopted by other U.S. Pacific states, the U.S. Federal Government, and the International Maritime Organization. Further, the best available science shows that a coastal voyage can transfer millions of organisms to a destination port. See ISOR for the proposed regulation, "Information Relied Upon."

Comment 14d: Consider that for ballast water exchange, a given distance off of the West Coast is more protective than the same distance off of other U.S. or European coasts, because of the narrow continental shelf on the Pacific West Coast.

Response: The requirement to exchange ballast in water at least 200 m deep and 50 nm offshore is based on recommendations provided by Pacific West Coast oceanographic experts during a workshop in 2002. In order to minimize the possibility that organisms discharged from vessels reached the shoreline, oceanographers recommended that exchange occur in areas deeper than 200 m. In order to avoid exchange in areas where water currents tend to retain organisms (retention zones), they recommended that ballast water exchange be conducted least 50 nm offshore of these regions. See ISOR, "Information Relied Upon."

Comment 14e: Consider that the majority of vessels will be able to meet the proposed regulation without undue burden.

Response: The Commission agrees with the commenter, and notes that no response is required.

Comment 14f: Consider that ports in Oregon, Washington, and British Columbia do not require exchange of vessels engaged in coastal voyages to accommodate short routes between these ports. The proposed regulation makes no such accommodations.

Response: The proposed regulation does accommodate vessels on short voyages within defined shared waters, as described in Section 2280(b). Vessels are not required to manage ballast when transiting wholly within the San Francisco Bay/San Joaquin/Sacramento Delta, or when transiting wholly within the Los Angeles/Long Beach/El Segundo port complex.

In addition, the regulation must be developed pursuant to California statute, and thus, is not required to conform with regulations of other U.S. states or countries. Vessels that are unable to comply with the proposed regulation due to issues not related to safety may be accommodated by provisions of Section 2283, "Alternatives." Such vessels may petition for an alternative to comply with the regulation. This may include regularly scheduled, short-distance voyages, provided that the petitioner includes all the data and information required to evaluate the merits of the petition, and that the proposed alternative fulfills the purpose of the proposed regulation. See comment 10f and response thereto.

Comment 14g: Consider that the stated goal of the proposed regulation is to create a harmonized approach between Pacific Coastal states.

Response: The regulation must be developed pursuant to California statute, and thus, is not required to conform with regulations of other U.S. states or countries. Nonetheless, it does create consistency with other North American Pacific states by requiring ballast water exchange at a distance offshore identical to those required by ballast water regulations or conventions in Washington, major Pacific Coast Canadian ports (Vancouver, Nanaimo, Fraser River), and the International Maritime Organization. The 50 nm distance is also identical to that prescribed by pending ballast water legislation in Oregon (Oregon HB 2170, 2005).

Comment 14h: Consider that the IMO Convention and Federal ballast water proposals accommodate vessels that would be required to deviate or extend their voyages to accomplish exchange.

Response: The language accommodating undue deviation and delay used in the U.S. Federal regulation and IMO Convention and are not adequately defined, as criteria for substantive deviation or delay is not set forth. Additionally, the regulation must be developed pursuant to California statute, and thus is not required to conform with other states or countries. Vessels that are unable to comply with the proposed regulation due to issues not related to safety may be accommodated by provisions of Section 2283, "Alternatives." Such vessels may petition for an alternative to comply with the regulation. These may include vessels on regularly scheduled short-haul voyages, provided that the petitioner includes all the data and information required to evaluate the merits of the petition, and that the proposed alternative fulfills the purpose of the proposed regulation. See comment 8 and response thereto.

Comment 14i: Consider that the effect of mandating these rules under all scenarios could seriously impede state commerce and burden the maritime industry.

Response: The proposed regulation does not mandate ballast water management under all circumstances. As described in Section 2281 "Safety of Ballasting Operations," ballast management is not required in circumstances that endanger a vessel, its crew or its passengers. Vessels that are unable to comply with the proposed regulation due to issues not related to safety may be accommodated by provisions of Section 2283, "Alternatives." Such vessels may petition for an alternative to comply with the regulation. These may include circumstances of undue financial hardship, provided that the petitioner includes all the data and information required to evaluate the merits of the petition, and that the proposed alternative fulfills the purpose of the proposed regulation.

Comment 16a: For vessels that cannot comply with the five ballast management practices required by Section 2284 due to vessel design or voyage duration, language is suggested that allows ballast water exchange "to the extent possible" in near coastal waters (at least 50 nm offshore and 200 m deep). For vessels on regular trade routes that are unable to comply, language is suggested that would allow vessels to petition for a vessel-specific, route-specific variance. For vessels on irregular routes, language is suggested to allow a petition for a one-time variance.

Response: Ballast water exchange "to the extent possible" is not adequately defined in the commenter's suggested language, and does not meet the clarity standard of the Administrative Procedures Act. Under such unspecified language, a vessel could exchange inadequate volumes of ballast providing little or no reduction for the risk of invasive species introduction. Such a scenario would not fulfill the intent of the enabling statute to, "protect the waters of the state."

Section 2283, "Alternatives," included in the proposed regulation already includes language allowing vessels that are unable to comply with the regulation due to issues not related to safety to petition for an alternative to comply with the regulation. As currently written, the petition process may be available to vessels traveling on regular trade routes, or to vessels on irregular trade routes, provided that the petitioner includes all the data and information required to evaluate the merits of the petition, and that the proposed alternative fulfills the purpose of the proposed regulation. Therefore, the suggested change in language is unnecessary.

Comment 16b: PMSA requests that review and approval of variance petitions for vessels under irregular routes or circumstances be completed at the staff level of the CSLC.

Response: For petitions that require an immediate response, the Commission has delegated authority to the Executive Officer for approving and disapproving requests for an "Alternative" under section 2283. In cases that do not require an immediate response, such as a request for a long-term or fleet-wide alternative, the Commission will approve or disapprove the request.

Comment 17: PMSA requests that a review of the effects of the proposed regulation is conducted 6–12 months after the regulation is implemented.

Response: A report reviewing the activities of the larger administrative program (Marine Invasive Species Program) is produced biennially as mandated by the Marine Invasive Species Act. The next report will be produced in January of 2007, approximately 16 months after the implementation of the proposed regulation, and will include the requested review. As such, a separate review and associated report would be redundant.

In addition, the Commission has required that after the regulation has been in effect for 12 months, staff evaluate and report on the impact of the regulation. This report will be presented at a subsequent Commission meeting that is open to the public.

Comment 18: The regulation should include accommodation or exemptions for vessels that are unable to comply with the proposed regulation due to economic hardship. The commenter provides a spreadsheet summary of estimated economic impacts the proposed regulation will place on five unnamed companies.

Response: Vessels that are unable to comply with the proposed regulation due to issues not related to safety may be accommodated by provisions of Section 2283, "Alternatives." Such vessels may petition for an alternative to comply with the regulation. These may include cases of extreme financial hardship, provided that the petitioner includes all the data and information required to evaluate the merits of the petition, and that the proposed alternative fulfills the purpose of the proposed regulation. See comment 11 and response thereto.

Written Comments of Jeff Browning, Sause Brothers Ocean Towing Co. Inc.

Comment 19: Unmanned barges are unable to manage ballast water through four of the five ballast water management options allowed by Section 2284 (near-coastal exchange, retention, alternative ballast water treatment, or discharge into a reception facility).

Response: Vessels that are unable to comply with the regulation due to issues not related to safety may be accommodated by provisions of Section 2283, "Alternatives." Such vessels may petition for an alternative to comply with the regulation, provided that the petitioner includes all the data and information required to evaluate the merits of the petition, and that the proposed alternative fulfills the purpose of the proposed regulation.

In addition, Section 2284 allows for a fifth ballast management option under extraordinary circumstances, which allows a vessel to exchange ballast in an area agreed to by the Commission in consultation with the U.S. Coast Guard. Should an

unmanned barge choose this ballast management option, it will be in compliance with the regulation.

Comment 20: In most cases, Sause Brothers, Inc. barges are able to take on and discharge ballast in the same port, or minimize the amount of ballast transported between ports.

Response: If the ballast water is taken on and discharged in the same place, and is not mixed with water from another port or place, the operation is in compliance with the statute. However, if a vessel discharges ballast water from one port or place in another port or place without undergoing ballast water management as described in section 2284, the vessel will be in violation of the law.

Comment 21: Sause Brothers, Inc. will apply their existing Federal ballast water plan to the plans for vessels that operate in California. An excerpt of Sause Brothers' Federal plan is included with the comment.

Response: The requirement to maintain a vessel-specific ballast water management plan onboard is not required by the proposed regulation. Rather, this requirement is mandated by the enabling statute (The Marine Invasive Species Act, P.R.C. § 71204).

Comment 22: Sause Brothers Inc. vessels that have operated outside U.S. EEZ and taken on ballast water less than 200 nm from shore typically discharge in the next Captain of the Port (COTP) zone, discharge in the same COTP zone as uptake, or discharge prior to entering port. Vessels will not deviate or delay a voyage to exchange ballast water 200 nm from shore due to safety reasons.

Response: Under the proposed regulation, vessels may opt to manage ballast water by exchanging 50 nm from shore. As such, vessels will not be required to deviate to locations 200 nm from shore.

Additionally, the requirement to manage ballast water originating from outside of the Pacific Coast Region is not addressed by the proposed regulation. Rather, requirements for management of such ballast water are described in the enabling statue (The Marine Invasive Species Act, P.R.C. § 71204.2). If ballast water originates from ports or places within the Pacific Coast Region, however, the proposed regulation will require vessels to manage ballast through one of the five options under Section 2284.

Vessels are not required to manage ballast water if faced with safety issues as described in Section 2281, and vessels unable to comply for reasons other than safety may petition for an alternative as described in Section 2283. See comments 11, 15, and 18, and response thereto.

Comment 23: If Sause Brothers, Inc. vessels are unable to conduct ballast management practices due to safety issues or voyage characteristics, they will not be prohibited from discharging minimal amounts operationally necessary.

Response: Vessels are not required to comply with the proposed regulation under conditions that endanger a vessel, its crew, and its passengers, as described in Section 2281 of the proposed regulation. Vessels that are unable to comply with the regulation due to issues not related to safety may be accommodated by provisions of Section 2283, "Alternatives." Such vessels may petition for an alternative to comply with the regulation, provided that the petitioner includes all the data and information required to evaluate the merits of the petition, and that the proposed alternative fulfills the purpose of the proposed regulation.

Following implementation of the proposed regulation, vessels that do not manage ballast water through one of the 5 management options of Section 2284, or through a petition for an alternative, will be in violation of the law. Violators may be subject to penalties set forth in the enabling statute, P.R.C. § 71204.2.

Comment 24: Sause Brothers, Inc. requests that it be exempt from the proposed regulation until ballast water reception facilities are available.

Response: Sause Brothers may present their petition and proposal for an alternative to the management practices to the Commission as described in Section 2283.

Written Comments of William Douros, National Marine Sanctuary Program, National Oceanic and Atmospheric Administration (NOAA)

Comment 25: The Northern California National Marine Sanctuaries (Cordell Bank, Gulf of the Farallones, and Monterey Bay) view non-native species introductions as a priority resource protection issue, and support the ballast water discharge restrictions of the proposed regulation. The Sanctuaries would like to coordinate with the CSLC on this issue in the future.

Response: The CSLC appreciates the support of the Sanctuary Program and looks forward to continuing a working relationship with them.

Written Comments of Jon Gurish, California Coastal Conservancy (letter dated 6/9/2005)—Late Comments

Comment 26: Commenter questions why the proposed regulation does not require the officer in charge of a vessel to document ballast water exchange time and location for purposes of audit.

Response: The enabling statute requires vessels submit information on date and time of ballast water exchange for every California port of call to the Commission (P.R.C. § 71205). As such, inclusion of the same requirements in the proposed regulation would be redundant.

Comment 27: The commenter believes that the placement of safety exemption language near the beginning of the text of the proposed regulation discourages compliance.

Response: The Commission disagrees. Regardless of the textual order, the requirement to comply with the regulation is mandatory. Vessels that do not comply will be in violation of the law and are subject to civil and/or criminal penalties.

Comment 28: The commenter questions why there are not audit requirements to evaluate compliance.

Response: The Commission currently conducts a vessel inspection program for purposes of audit and compliance evaluation, as mandated by P.R.C. § 71206 of the enabling statute. As such, inclusion of the same requirements in the proposed regulation would be redundant.

Written Comments of John Berge, Pacific Merchant Shipping Association (2nd Letter, Dated 6–8–2005)

Comment 29: PMSA suggests additional language to the proposed regulation that allows vessels to petition the Commission for a variance to the proposed regulation for reasons of vessel design or voyage duration.

Response: A provision for petitions of alternatives to the proposed regulation is already included in the current version of the proposed regulation, Section 2283, "Alternatives." Vessels that are unable to comply with the regulation due to issues not related to safety may be accommodated by provisions of Section 2283, "Alternatives." These may include vessels that unable to comply for reasons of vessel design or voyage duration, provided that the petitioner includes all the data and information required to evaluate the merits of the petition, and that the proposed alternative fulfills the purpose of the proposed regulation. Thus, including the commenter's suggested language would be redundant.

Written Comments of Capt. Khush Fritter, K.P. Fitter & Associates, Inc. (Letter Dated 6–9–2005)—Late Comment

Comment 30a: Ballast operations are required for safe cargo operations. Deballasting and ballasting at sea can be unsafe and can cause stress on the hull.

Response: Vessels are not required to comply with the proposed regulation under conditions that endanger a vessel, its crew, and its passengers, as described in Section 2281 of the proposed regulation. Vessels that are unable to comply with the regulation due to issues not related to safety may be accommodated by provisions of Section 2283, "Alternatives." Such vessels may petition for an alternative to comply with the regulation, provided that the petitioner includes all the data and information required to evaluate the merits of the petition, and that the proposed alternative fulfills the purpose of the proposed regulation.

Comment 30b: Statute AB 433 prescribes sedimentation reduction and control, and should be addressed.

Response: The comment does not pertain to the proposed regulation, and does not need to be addressed. Further, sedimentation reduction and control was not mandated in AB 433 (2004), by which the controlling statue P.R.C. § 71204.5 was enacted.

Comment 30c: The commenter states that some vessels will have to travel 75 miles offshore and remain for over 10 hours to conduct exchange, causing longer routes, voyage delay, increased costs, and pose a danger for crew and vessels.

Response: Vessels are not required to comply with the proposed regulation under conditions that endanger a vessel, its crew, and its passengers, as described in Section 2281 of the proposed regulation. Vessels that are unable to comply with the regulation due to issues not related to safety may be accommodated by provisions of Section 2283, "Alternatives." These may include cases of extreme financial hardship. Such vessels may petition for an alternative to comply with the regulation, provided that the petitioner includes all the data and information required to evaluate the merits of the petition, and that the proposed alternative fulfills the purpose of the proposed regulation.

Comment 30d: The commenter states that there will be an increased risk of collision when vessels cross the Traffic Separation Scheme off the West Coast.

Response: The proposed regulation does not define routes by which vessels must travel in order to conduct ballast exchange. There is no legal shipping traffic scheme requiring tankers or other vessels to transit 50 nm offshore or otherwise. See comment 10a and response thereto.

Comment 31a: Mariners on foreign flagged vessels will give highest importance to IMO regulations, secondary importance to Federal regulations, and lowest importance to regional regulations different from Federal ones. The proposed regional regulations will likely not be incorporated into documents a master will rely upon for guidance.

Response: Compliance rates by foreign vessels for other CSLC regulations are very high. For example, the requirement to manage ballast water originating outside the U.S. EEZ, has consistently exceed 90 percent since 2000 (P.R.C. § 71204.3). Therefore, it is anticipated that compliance rates with the proposed regulation will also be very high.

As with other CSLC regulations, education and outreach will continue with the implementation of the proposed regulation, with the goal of informing mariners of California state regulations.

Comment 31b: K.P. Fitter and Associate, Inc. associated tugs and barges will find it difficult to comply with the proposed regulation.

Response: Vessels are not required to comply with the proposed regulation under conditions that endanger a vessel, its crew, and its passengers. Vessels that are unable to comply with the regulation due to issues not related to safety may be accommodated by provisions of Section 2283, "Alternatives." Such vessels may petition for an alternative to comply with the regulation. These may include cases of extreme financial hardship, provided that the petitioner includes all the data and information required to evaluate the merits of the petition, and that the proposed alternative fulfills the purpose of the proposed regulation.

Written Comments of Peter Korody, Indlandbotman's Union of the Pacific

Comment 32: The proposed regulation will pose serious risk to crew members on tug boats, particularly when personnel must transfer from a tug to a barge in open ocean.

Response: Vessels are not required to comply with the proposed regulation under conditions that endanger a vessel, its crew, and its passengers, as described in Section 2281 of the proposed regulation. Vessels that are unable to comply with the regulation due to issues not related to safety may be accommodated by provisions of Section 2283, "Alternatives." Such vessels may petition for an alternative to comply with the regulation, provided that the petitioner includes all the data and information required to evaluate the merits of the petition, and that the proposed alternative fulfills the purpose of the proposed regulation. See comment 33 and response hereto.

Oral comments of Jason Lewis, American Waterways Operators (Public Hearing transcript, 6/8/2005, Oakland)

Comment 33: Ballast is essential for the safe operation of tugs and barges. The process of ballast water exchange as required by the proposed regulation can be impractical and unsafe, because it requires that a tug or other small boat come along side a barge and transfer of personnel between them. Articulated tug barges (ATB's) can become disconnected and result in an uncontrolled barge.

Response: Vessels are not required to comply with the proposed regulation under conditions that endanger a vessel, its crew, and its passengers, as described in Section 2281 of the proposed regulation. Vessels that are unable to comply with the regulation due to issues not related to safety may be accommodated by provisions of Section 2283, "Alternatives." Such vessels may petition for an alternative to comply with the regulation. These may include cases of extreme financial hardship, provided that the petitioner includes all the data and information required to evaluate the merits of the petition, and that the proposed alternative fulfills the purpose of the proposed regulation.

Comment 34: The States of Oregon and Washington include provisions for safety and feasibility regulations.

Response: The proposed regulation makes accommodation for safety and feasibility. Vessels are not required to comply with the proposed regulation under conditions that endanger a vessel, its crew, and its passengers, as described in Section 2281 of the proposed regulation. Vessels that are unable to comply with the regulation due to issues not related to safety may be accommodated by provisions of Section 2283, "Alternatives." Such vessels may petition for an alternative to comply

with the regulation. These may include cases of extreme financial hardship, provided that the petitioner includes all the data and information required to evaluate the merits of the petition, and that the proposed alternative fulfills the purpose of the proposed regulation.

Additionally, though the proposed regulation does provide safety exemptions as do neighboring Pacific states, the regulation must be developed pursuant to California statute (P.R.C. § 71204.2), and thus, is not required to conform with regulations of other U.S. states or countries.

Comment 35: The shipping industry's Ballast Water Coalition has reached the conclusion that ballast water exchange for the tug and barge industry is inherently unsafe.

Response: Vessels are not required to comply with the proposed regulation under conditions that endanger a vessel, its crew, and its passengers, as described in Section 2281 of the proposed regulation. Vessels that are unable to comply with the regulation due to issues not related to safety may be accommodated by provisions of Section 2283, "Alternatives." Such vessels may petition for an alternative to comply with the regulation. These may include cases of extreme financial hardship, provided that the petitioner includes all the data and information required to evaluate the merits of the petition, and that the proposed alternative fulfills the purpose of the proposed regulation.

In addition, the proposed regulations allow for other ballast water management options in addition to exchange. Vessels may choose to retain ballast, use an alternative ballast management method (treatment system) approved by the Commission or USCG prior to the voyage, or discharge ballast to an approved reception facility. It is hoped that vessels currently unable to manage ballast through exchange will begin actively pursuing alternative management options, such as shore-based or shipboard treatment system development.

Comment 36: Ballast exchange is inherently unsafe for American Waterway Operators (AWO) members and vessel owners should not be required to risk the lives of crew.

Response: Vessels are not required to comply with the proposed regulation under conditions that endanger a vessel, its crew, and its passengers, as described in section 2281, "Safety of Ballasting Operations."

Comment 37: The AWO requests that the proposed regulation use Washington as a reference for the development of them, due to unique nature of tugs and barges.

Response: Though the proposed regulation does provide safety exemptions as do neighboring Pacific states, the regulation must be developed pursuant to California statute (P.R.C. § 71204.2). Conformity with regulations of other U.S. states or countries may not therefore be possible.

Oral Comments of John Berge, PMSA (Public Hearing transcript, 6/8/2005, Oakland)

Comment 38: PMSA views the goal to reduce the risk of invasive species introductions between coastal U.S. ports as the next logical step from the currently regulated goal of preventing invasions from outside the U.S. EEZ. Ballast water exchange is the only viable, current ballast management option, until technologies are developed to treat ballast water on-board a vessel.

Response: Noted. The Commission agrees with the commenter.

Comment 39: PMSA lauds and supports the Commission's efforts to carefully analyze ballast water movements to formulate the proposed regulation. Though the proposed regulation is a compromise between practicality and invasive species risk reduction, he views the proposed regulation as an improvement to the current program that places an acceptable burden on the shipping industry.

Response: Noted. The Commission agrees with the commenter.

Comment 40: The vast majority of PMSA members will be able to comply with the regulation without threatening their economic viability. However, a small number of ships will face economic difficulties due to vessel design or voyage duration.

Response: Noted. Vessels that are unable to comply with the regulation due to issues not related to safety may be accommodated by provisions of Section 2283, "Alternatives." Such vessels may petition for an alternative to comply with the regulation. These may include cases of extreme financial hardship, provided that the petitioner includes all the data and information required to evaluate the merits of the petition, and that the proposed alternative fulfills the purpose of the proposed regulation.

Comment 41: Regulators must accommodate the small population of vessels that will be placed in an economically untenable situation due to vessel design, extended voyage duration, as required by P.R.C. § 71204.5(a).

Response: The Commission considered the issue of vessel design and voyage duration in the proposed regulation, and as such included Section 2283, "Alternatives," in the proposed regulation. Vessels that are unable to comply with the regulation due to issues not related to safety may petition the Commission for a ballast management alternative. The petitioner must provide all the data and information required to evaluate the merits of the petition, and that the proposed alternative must fulfill the purpose of the proposed regulation. Petitioners may include owners or operators of vessels that are unable to comply for reasons of vessel design, voyage duration, or economic hardship.

Comment 42: The commenter requests the completion of a review of the program 6–12 months after implementation of the proposed regulation.

Response: A report reviewing the activities of the larger administrative program (Marine Invasive Species Program) is produced biennially as mandated by the Marine Invasive Species Act. The next report will be produced in January of 2007, approximately 16 months after the implementation of the proposed regulation, and will include the requested review. As such, a separate review and associated report would be redundant. See comment 17, and response thereto.

Comment 43: PMSA is dedicated to the implementation and success of the proposed regulation and ask that agencies recognize physical and logistical limitations of vessels as the regulation moves forward.

Response: The Commission recognizes the safety, physical, and logistical limitations of vessels in relation to the proposed regulation. As such, accommodations have been included for vessels that encounter safety issues and other formidable difficulties while attempting to comply. Vessels are not required to comply with the proposed regulation under conditions that endanger a vessel, its crew, and its passengers, as described in Section 2281. Vessels that are unable to comply with the regulation due to issues not related to safety may be accommodated by provisions of Section 2283, "Alternatives." Such vessels may petition for an alternative to comply with the regulation. These may include cases of extreme financial hardship, provided that the petitioner includes all the data and information required to evaluate the merits of the petition, and that the proposed alternative fulfills the purpose of the proposed regulation.

Alternatives Determination

The State Lands Commission has determined that no alternative would be more effective in carrying out the purpose for which the regulation is proposed or would be as effective and less burdensome to affected private persons than the proposed regulation.

Local Mandate Determination

The proposed regulations do not impose any mandate on local agencies or school districts.

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