PROTECTING OUR GREAT LAKES: BALLAST WATER AND THE IMPACT OF INVASIVE SPECIES

HEARING

BEFORE THE

SUBCOMMITTEE ON REGULATORY AFFAIRS

OF THE

COMMITTEE ON
GOVERNMENT REFORM

HOUSE OF REPRESENTATIVES

ONE HUNDRED NINTH CONGRESS

FIRST SESSION

SEPTEMBER 9, 2005

Serial No. 109–98

Printed for the use of the Committee on Government Reform

Available via the World Wide Web: http://www.gpoaccess.gov/congress/index.html
http://www.house.gov/reform

U.S. GOVERNMENT PRINTING OFFICE

24–893 PDF WASHINGTON : 2005

For sale by the Superintendent of Documents, U.S. Government Printing Office
Internet: bookstore.gpo.gov Phone: toll free (866) 512–1800; DC area (202) 512–1800
Fax: (202) 512–2250 Mail: Stop SSOP, Washington, DC 20402–0001

COMMITTEE ON GOVERNMENT REFORM

TOM DAVIS, Virginia, *Chairman*

CHRISTOPHER SHAYS, Connecticut
DAN BURTON, Indiana
ILEANA ROS-LEHTINEN, Florida
JOHN M. MCHUGH, New York
JOHN L. MICA, Florida
GIL GUTKNECHT, Minnesota
MARK E. SOUDER, Indiana
STEVEN C. LATOURETTE, Ohio
TODD RUSSELL PLATTS, Pennsylvania
CHRIS CANNON, Utah
JOHN J. DUNCAN, JR., Tennessee
CANDICE S. MILLER, Michigan
MICHAEL R. TURNER, Ohio
DARRELL E. ISSA, California
GINNY BROWN-WAITE, Florida
JON C. PORTER, Nevada
KENNY MARCHANT, Texas
LYNN A. WESTMORELAND, Georgia
PATRICK T. MCHENRY, North Carolina
CHARLES W. DENT, Pennsylvania
VIRGINIA FOXX, North Carolina

HENRY A. WAXMAN, California
TOM LANTOS, California
MAJOR R. OWENS, New York
EDOLPHUS TOWNS, New York
PAUL E. KANJORSKI, Pennsylvania
CAROLYN B. MALONEY, New York
ELIJAH E. CUMMINGS, Maryland
DENNIS J. KUCINICH, Ohio
DANNY K. DAVIS, Illinois
WM. LACY CLAY, Missouri
DIANE E. WATSON, California
STEPHEN F. LYNCH, Massachusetts
CHRIS VAN HOLLEN, Maryland
LINDA T. SANCHEZ, California
C.A. DUTCH RUPPERSBERGER, Maryland
BRIAN HIGGINS, New York
ELEANOR HOLMES NORTON, District of Columbia

BERNARD SANDERS, Vermont (Independent)

MELISSA WOJCIAK, *Staff Director*
DAVID MARIN, *Deputy Staff Director/Communications Director*
ROB BORDEN, *Parliamentarian*
TERESA AUSTIN, *Chief Clerk*
PHIL BARNETT, *Minority Chief of Staff/Chief Counsel*

SUBCOMMITTEE ON REGULATORY AFFAIRS

CANDICE S. MILLER, Michigan, *Chairman*

GINNY BROWN-WAITE, Florida
CHRIS CANNON, Utah
MICHAEL R. TURNER, Ohio
LYNN A. WESTMORELAND, Georgia

STEPHEN F. LYNCH, Massachusetts
WM. LACY CLAY, Missouri
CHRIS VAN HOLLEN, Maryland

EX OFFICIO

TOM DAVIS, Virginia

HENRY A. WAXMAN, California

ED SCHROCK, *Staff Director*
ERIK GLAVICH, *Professional Staff Member*
ALEX COOPER, *Clerk*
KRISTA BOYD, *Minority Counsel*

CONTENTS

PROTECTING OUR GREAT LAKES: BALLAST WATER AND THE IMPACT OF INVASIVE SPECIES

FRIDAY, SEPTEMBER 9, 2005

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON REGULATORY AFFAIRS,
COMMITTEE ON GOVERNMENT REFORM
Fair Haven, MI.

The subcommittee met, pursuant to notice, at 2:03 p.m., at the Anchor Bay High School Auditorium, 6319 County Line Road, Fair Haven, MI, Hon. Candice S. Miller (chairman of the subcommittee) presiding.

Present: Representatives Miller, Lynch, and Westmoreland.

Staff present: Edward Schrock, staff director; Erik Glavich, professional staff member; Alex Cooper, clerk; and Krista Boyd, minority counsel.

Mrs. MILLER. Good afternoon. There are some making sure we're organized here and ready to go.

I certainly want to first of all bring the Subcommittee on Regulatory Affairs to order. And, I want to thank everybody for attending today's hearing.

This is quite a remarkable thing, actually. We're trying to bring Washington to Michigan, in the 10th Congressional District of Michigan——

VOICE. Turn up the volume.

Mrs. MILLER [continuing]. Specifically.

Can you hear us there?

VOICE. No.

Mrs. MILLER. Whoever's in charge of sound, maybe I need to bring it a little closer to me.

How about that? Is that helpful?

VOICE. Yeah.

Mrs. MILLER. All right. We'll try to remember to talk into the microphones here as we can.

Today we're going to be having a hearing on invasive species, on the kind of impact, and principally negative, in many cases very negative, that invasive species have on our magnificent Great Lakes, and principally through ballast water.

And I certainly want to take a few moments to thank many of the individuals who have helped us to make this hearing possible today.

And let me thank everybody who's involved with the Anchor Bay School District certainly. And in particular, I want to thank Anchor

Bay High School for all of their assistance, and the Principal here, Judy Stefanac. She was just here a moment ago, and I see her out in the audience there.

And she gave me a fantastic tour of this school. And it certainly is not what the high schools that many of us are used to or think about where we came from. It's just a fantastic facility. The community is so very proud of it.

I think that this hearing today will hopefully provide the citizens of the 10th Congressional District, and the people throughout the southeast Michigan, and hopefully the students, in particular the students, an opportunity to understand a little bit about the Federal Government, and how it works, and the hearing process, and etc. And we wanted to have this hearing in a high school so students would be able to understand that things that happen at the Federal level and in Washington, DC, seem so far away from them, but in fact they're very, very pertinent to their lives and do have an impact. And I know we have some students in the audience today. And hopefully they'll understand the government. It certainly does matter in their lives; and we do live in a democracy. And perhaps my generation has not done the best job of being a steward of our environment, but we look forward to the next generation, you young people that join with us today or who will be using this hearing as part of your curriculum, that we're looking to you to do a better job, perhaps, than what we've done. And we're interested in trying to afford you the information that we can about a very, very important issue in our area.

As well, this hearing is being broadcast through a five-county area, all the way up to the very tip of the thumb, and will as I said, be used in high schools throughout the entire district, the 10th District.

I also want to thank Mark Cummins of the Macomb Intermediate School District, who was very helpful today, and Terry Harrington of the St. Clair County Regional Educational Service Agency. These are the individuals who have really helped to put together the broadcast and the mechanics, if you will, of orchestrating today's proceedings.

And we have a number of witnesses. And I will introduce each of them as we begin our hearing. They've come from across Michigan, from other parts of our country, from Washington, DC. And all of them want to talk about ballast water management, the Regulatory Drain Board that our Nation has, and the impact of the invasive species on our economy and our environment.

As I stated, we're prepared to examine the Federal Government's efforts to stop the threat that invasive species pose on our Great Lakes and on our Nation's very delicate aquatic ecosystems. This issue is vitally important to all residents of the Great Lakes region, not just those of us in Michigan, but every one of the States, and the Canadian government as well in the entire basin.

Lake St. Clair, in fact, where the dreaded zebra mussels were first discovered, was just a few miles from where we're sitting here today. This is a very little tiny thing, about the size of a thumbnail, maybe even smaller, that has really devastated the lakes and started a chain of events that has lead us here today.

Since the zebra mussel's introduction in 1988, the threat and the impact of endangered species has not subsided. The zebra mussels has spread to waterways throughout the eastern United States; and non-native species such as the round goby are absolutely devastating our native fish populations and destroying the ecosystem as we know it.

In fact experts, and we'll hear some of this testimony today, actually estimate that we currently have over 180 different types of invasive species in the Great Lakes.

With the opening of the St. Lawrence Seaway back in 1959, trade through the Great Lakes expanded. And, of course, this was a very good thing for Michigan, and the Great Lakes basin trade, particularly on our Great Lakes as a very important artery and economic impetus for us. On the other hand, with the increase of this trade, the threat of invasive species exploded as well, and it continues to be as high as ever.

In response to the introduction of the zebra mussels, Congress directed the Coast Guard to establish ballast water management regulations for ships carrying ballast water that enter the Great Lakes after operating outside of U.S. waters. The Coast Guard issued final mandatory regulations in April 1993. Realizing that the threat posed by invasive species was not contained strictly to the Great Lakes, Congress then directed the Coast Guard to expand its regulations to a national level. In response, the Coast Guard issued an interim rule which established voluntary national guidelines in 1999. These voluntarily guidelines became mandatory effective on September 27, 2004.

The Coast Guard is a Federal agency that wears many, many hats. And we're going to have an opportunity to introduce a representative from the Coast Guard here today. And although we may have some tough questions about how the Coast Guard is handling invasive species, let me just say particularly this week, after the unbelievable work that we have seen demonstrated by the U.S. Coast Guard in response to Hurricane Katrina on our gulf, it has been an amazing thing for the entire Nation to watch the Coast Guard. Not only as we see you on the front line of the war on terror, but now as the Coast Guard has responded, as we would have always expected you to do, but you did so unbelievably well, and honorably, and bravely, saving literally tens of thousands of our fellow Americans in the gulf.

And I think we, on behalf of a very grateful Nation, to Commander Moore of the Coast Guard, I'd like to thank you and the entire Coast Guard, as you've been a wonderful thing to see, I think, the Coast Guard and how they responded as well.

But in addition to all of this, the Congress has also given the Coast Guard the responsibility of regulating many aspects of shipping on U.S. water, and that includes the discharge of ballast water. And in the 15 years since Congress has directed the Coast Guard to deal with the invasive species issues, critics have charged that the Coast Guard efforts have been ineffective. The threat has not decreased, and regulations exempt heavily loaded ships with no ballast water on board. These ships are commonly called NOBOBs. They account for 90 percent of all ships entering into the Great Lakes system. That's NOBOBs, as I say, no ballast water on board.

And they contain residual water in their ballast tank, and pose a very great threat.

On August 31st, just a week and a half ago, the Coast Guard issued voluntarily guidelines for NOBOBs. But critics argue that more aggressive action is needed now. And I think in light of the fact that we're just a week and a half after those regulations had been issued, it's very important that we have this hearing. It's very timely today.

Currently the only accepted ballast water management practice is a mid-ocean ballast water exchange. There exists no Coast Guard approved alternate methods to treat ballast water, mainly because the Coast Guard has been unable to approve any methods because it's failed to establish a measurable standard for ballast water that's safe to be discharged. This standard, which is referred to as a "discharge standard," is necessary if the shipping industry is to develop and to install technologies that can treat ballast water as effectively as a ballast water exchange. The international community established its own discharge standard in February 2004. The Coast Guard led these international efforts.

Clearly there is much more action that needs to take place at home, and there's signs that the Coast Guard is getting ready to issue its own discharge standard. And I certainly hope that Commander Moore, who joins us today, can expand a little bit on the efforts the Coast Guard is taking to improve the ballast water regulatory framework.

In the Great Lakes region, it's been estimated that $8 billion has been spent thus far since the zebra mussel's introduction, to mitigate the damage that it has caused; with another $5 billion price tag in the next 10 years. Scientists have estimated that 10 billion round gobies reside in the northern half of Lake Erie alone.

Invasive species destroy our ecosystems. And unless the door is shut, these very nasty little creatures will continue to hitch a ride in ballast tanks across the Atlantic, and find new homes right here in our magnificent Great Lakes.

The State understands this. In fact, no less than 10 States have passed laws governing ballast water. The State of Michigan, for example, has passed a law that defines ballast water as pollution. And we require ships to obtain a permit before it can be discharged.

Additionally, a coalition of Great Lakes States petitioned the Coast Guard in 2004, asking them to act on the problems posed by NOBOBs. These States have even reported legal efforts to get the EPA to regulate ballast water through the Clean Water Act.

And why have the States taken these measures? Because they are very, very frustrated. They've seen the devastating impact of invasive species, and they feel as though the Federal Government has not done its job to help them.

Preventing the introduction of endangered species requires a cooperative effort between different Federal agencies, States, and certainly the international community. It will take a lot of work to remove this threat posed by the ballast water of ships.

So we've seen the problem, and now we need to work together to find a solution.

And I'm pleased that we've been able to assemble a fine young panel of witnesses. We're looking forward to hearing from all of them so we can have a better understanding of what we might be able to do at the congressional level of the Federal Government. And we want to thank all of you for coming.

And before we start here, I also want to extend my gratitude to the other members of the subcommittee who have joined with us here today, my other two colleagues. First of all a ranking member, Stephen Lynch, Congressman Stephen Lynch is from Massachusetts. And let me just give you a brief introduction of him.

Congressman Lynch was actually first born into the U.S. Congress in October 2001, and has been re-elected twice. He represents Massachusetts 9th Congressional District, and he's a lifelong resident of south Boston. Prior to his career as a public servant, Ranking Member Lynch worked as a structural iron worker for 18 years, and he served as the president of the Iron Workers Union. And as an iron worker, he worked at the General Motors in Framingham, MA, and the General Dynamics Shipyard in Quincy, and also the U.S. Steel Plant in Gary, IN.

Mr. Lynch continues to live in south Boston with his wife Margaret and their 5-year-old daughter Victoria.

We certainly welcome you, Congressman Lynch. We appreciate you coming so very, very much.

And also Congressman Lynn Westmoreland, who joins us from Georgia actually. He entered the Congress this year. He's a freshman. He said he wanted to come to Congress so he could be referred to as a freshman again, it's like being in high school. But he represents Georgia's 8th Congressional District, which stretches from the suburbs of Atlanta to Macon into Columbus. He served in the Georgia State House of Representatives for 12 years, the last 3 years as minority leader there before coming to Washington. And, actually before becoming a public servant, he started his own building company.

And if you've had a chance to see some of the things that are happening in northern Macomb County, see, we have a lot of building going on there which we're very proud of.

So Mr. Westmoreland and his wife Joan have been married for 36 years. They have three children, and four grandchildren. So we welcome them both here as well.

And I see that our State Attorney General Mike Cox has also joined us, and we're going to be hearing from him in just a moment. We appreciate you all coming.

[The prepared statement of Hon. Candice S. Miller follows:]

"Protecting our Great Lakes: Ballast Water and the Impact of Invasive Species"
Opening Statement of Chairman Candice S. Miller
Subcommittee on Regulatory Affairs
Committee on Government Reform

Friday, September 9, 2005, 2:00 p.m.

Anchor Bay High School
6319 County Line Road
Fair Haven, Michigan

Good afternoon. The Subcommittee on Regulatory Affairs will come to order. I would like to welcome everyone to today's hearing on efforts to prevent the introduction of invasive species into U.S. waters—particularly the Great Lakes—through ballast water.

I want to take this opportunity to thank the individuals responsible for making this hearing possible.

I would first like to thank everyone at the Anchor Bay School District. In particular, I want

to send my heartfelt thanks to Anchor Bay High School and its principal—Judy Stefanac—for hosting this event. The facilities here are wonderful, and we are truly grateful you have opened your doors and welcomed us.

The hearing today presents a unique opportunity to the citizens of the 10th Congressional District—particularly the students. A Congressional hearing in this area is unprecedented and allows our students to learn firsthand the Congressional process, activities of Federal agencies, and the impact of those actions.

By bringing this hearing to Anchor Bay High School here in northern Macomb County, I

hope our students will listen to the testimony and questions; and hopefully, they will understand that government does matter in their lives.

This is a phenomenal opportunity for these students. To enhance this opportunity, I have chosen to incorporate some input from the students here at the high school. They have developed some questions they find important, and I will do my best to incorporate their concerns into the proceedings today.

Not only is this hearing available to the students of Anchor Bay High School, county officials have worked to make a live broadcast available to schools throughout the Thumb. This is

possible because of the hard work of many individuals behind the scenes who understand the educational opportunity before us.

I want to personally thank Mark Cummins of the Macomb Intermediate School District, Terry Harrington of the St. Clair County Regional Educational Service Agency, and all those individuals who have helped us broadcast this hearing live so that students, teachers, and the public can watch the hearing.

We have a very distinguished group of witnesses who have made the trip to Anchor Bay High School to be with us today. We are honored to have Michigan Attorney General Mike Cox with us. Attorney General Cox, thank

you for taking time out of your busy schedule to participate in today's proceedings.

Our other witnesses have traveled from Washington, across Michigan, and other areas in the Great Lakes region to provide us their insight on the effectiveness of the nation's ballast water management regulatory framework and the impact of invasive species on our economy and environment.

Thank you all for being here. Your presence is greatly appreciated.

As I stated, we are here to examine the Federal government's efforts to stop the threat invasive species pose on the Great Lakes and our

nation's delicate aquatic ecosystems. This issue is vitally important to all residents of the Great Lakes region. Lake St. Clair, where the dreaded zebra mussel was discovered, sits only six miles from where we are sitting. This tiny little thing has devastated the lakes and started the chain of events that have led us here today.

Since the zebra mussel's introduction in 1988, the threat and impact of invasive species has not subsided. The zebra mussel has spread to waterways throughout the eastern United States; and non-native species such as the round goby are devastating native fish populations and destroying the ecosystem as we know it. In fact, there are now an estimated

180 different invasive species in the Great Lakes.

With the opening of the St. Lawrence Seaway in 1959, trade through the Great Lakes has expanded. With this increase in trade, the threat of invasive species exploded and continues to be as high as ever.

In response to the introduction of the zebra mussel, Congress directed the Coast Guard to establish ballast water management regulations for ships carrying ballast water that enter the Great Lakes after operating outside U.S. waters. The Coast Guard issued final mandatory regulations in April 1993.

Realizing the threat posed by invasive species was not contained strictly to the Great Lakes, Congress directed the Coast Guard to expand its regulations to a national level. In response, the Coast Guard issued an interim rule which established voluntary national guidelines in 1999. These voluntary guidelines became mandatory effective September 27, 2004.

One of our witnesses from Washington is Commander Kathy Moore of the U.S. Coast Guard. Commander Moore, I want to express to you the highest appreciation of this Subcommittee—and of all citizens, frankly—for the Coast Guard's efforts in fighting the global war on terrorism. In addition, the Coast Guard's efforts down in the gulf states in

response to the horrible situation there has been most admirable. The men and women of the United States Coast Guard are all heroes, and I want to personally make sure that the men and women of the Coast Guard know that the citizens of this country thank them for all of their efforts.

The Coast Guard is a Federal agency that wears many hats. In addition to being the first line of defense in securing the homeland, Congress has given it the responsibility of regulating many aspects of shipping on U.S. waters—including the discharge of ballast water. In the 15 years since Congress directed the Coast Guard to deal with invasive species, critics charge the Guard's efforts have been

ineffective. The threat has not decreased, and the regulations exempt heavily loaded ships with no ballast water onboard. These ships—known as NOBOBs—account for 90 percent of all vessels entering the Great Lakes. NOBOBs contain residual water in their ballast tanks and pose a great threat.

On August 31—a week and a half ago—the Coast Guard issued voluntary guidelines for NOBOBs. But critics argue that more aggressive action is needed now.

Currently, the only accepted ballast water management practice is a mid-ocean ballast water exchange. There exist no Coast Guard approved alternative methods to treat ballast

water, mainly because the Coast Guard has been unable to approve any methods because it has failed to establish a measurable standard for ballast water as safe to be discharged.

This standard—referred to as a "discharge standard"—is necessary if the shipping industry is to develop and install technologies that can treat ballast water as effectively as a ballast water exchange. The international community established its own discharge standard in February 2004. The Coast Guard led these international efforts.

Clearly, there is much more action that needs to take place at home, and there are signs that the Coast Guard is getting ready to issue its own

discharge standard. I hope that Commander Moore can expound on the efforts the Coast Guard is taking to improve the ballast water regulatory framework.

In the Great Lakes region, it has been estimated that 8 billion dollars has been spent since the zebra mussel's introduction to mitigate the damage caused—with another 5 billion dollar price tag in the next ten years. Scientists have estimated that 10 billion round gobies reside in the western half of Lake Erie alone.

Invasive species destroy our ecosystems—plain and simple. Unless the door is shut, these nasty little creatures will continue to hitch a ride

in ballast tanks across the Atlantic and find new homes right here in our precious Lakes.

Ladies and gentleman, this is the reason we are holding this hearing. I have spent my entire life enjoying the Great Lakes; and I know personally how people's lives depend on a healthy Great Lakes ecosystem.

The states understand this. No less than ten states have passed laws governing ballast water. The State of Michigan—for example—has passed a law that defines ballast water as pollution and requires ships to obtain a permit before it can be discharged.

Additionally, a coalition of Great Lakes states petitioned the Coast Guard in 2004—asking them to act on the problems posed by NOBOBs. These states have even supported legal efforts to get the EPA to regulate ballast water under the Clean Water Act.

Why have the states taken these measures? Because they are frustrated. They have seen the devastating impact of invasive species, and they feel as though the Federal government has ignored their cries for help.

Preventing the introduction of invasive species requires a cooperative effort between different Federal agencies, the states, and the international community. It will take a lot of

work to remove the threat posed by the ballast water of ships.

We have seen the problem, and now we must work together to find the solution.

I am pleased that we have been able to assemble a fine panel of witnesses. I hope they can tell us what is being done to stop the threat of invasive species and how effective measures have been up to this point. Again, thank you all for taking the time to be with us today.

Now, I would like to extend my gratitude to the other Members of the Subcommittee who have joined us—Ranking Member Stephen Lynch of

Massachusetts and Representative Lynn Westmoreland of Georgia.

Congressman Lynch was first sworn into the U.S. Congress in October 2001, and has since been re-elected twice. Representing Massachusett's 9th District, he is a lifelong resident of South Boston. Prior to his career as a public servant, Ranking Member Lynch worked as a structural ironworker for 18 years and served as president of the Iron Workers Union. As an ironworker, Congressman Lynch worked at the General Motors plant in Framingham, Massachusetts, the General Dynamics Shipyard in Quincy, Massachusetts, and the U.S. Steel Plant in Gary, Indiana. The residents of Southeast Michigan can truly

appreciate the work he has done throughout his life. Mr. Lynch continues to live in South Boston with his wife Margaret and their 5-year-old daughter Victoria.

Congressman Lynn Westmoreland entered Congress in January of this year. Residing in Grantville, Georgia, he represents Georgia's 8th District, which stretches from the suburbs of metro Atlanta to Macon and Columbus. Congressman Westmoreland served in the Georgia State House of Representatives for 12 years—the last 3 years as Minority Leader—before coming to Washington. Before becoming a public servant, the Congressman started his own building company. Anyone familiar with northern Macomb County can truly

appreciate the contributions of builders in improving the standard of living. Congressman Westmoreland and his wife Joan have been married for 36 years. They have three children and four grandchildren.

Again, I want to thank both Ranking Member Lynch and Congressman Westmoreland for their presence today. Both of their home states are home to ports engaged in high levels of maritime trade; and their participation at this hearing reiterates the national importance of this issue. Thank you both for your attendance.

I would now like to recognize the Ranking Member for his opening statement.
Mr. Lynch…

Mrs. MILLER. I'd like to now recognize the ranking member for his opening statement. Congressman Lynch.

Mr. LYNCH. Thank you, Chairman Miller.

First of all, I want to thank you, chairman, and also Julie Stefanac, for being a wonderful host. And I know this is televised in five districts in this area. I hope it's not televised in my district, because if people see what you have here for a beautiful high school, I think I would be under a lot of pressure to replicate this in my district. It's absolutely a magnificent example of the priority that Michigan has given to education.

Mrs. MILLER. Thank you.

Mr. LYNCH. And I think it's a wonderful credit to your political leadership here for having done so. I do appreciate your leadership. I think I speak for all of the Members of Congress in appreciation of Chairman Miller and what she has done to bring the issue of invasive species contaminating our waterways, not just Great Lakes.

But I actually have the honor of representing the Port of Boston, and we've just spent several billion dollars on cleaning up that port, and now we are in fear of the fact that our waterways, our beautiful harbor, may be contaminated, compromised by invasive species, just as the people who love and who appreciate the beauty of the Great Lakes are concerned about the situation around their homes and in their neighborhoods.

These invasive species are wreaking havoc on bodies of water all across the country. And according to the EPA, invasive species are the second leading cause of species extension, and a loss of biodiversity in aquatic and marine environments around the world.

As I said, I have—my office is actually about 50 yards from Boston Harbor. And we just spent so much money on that system, and now the ecosystem there is under the same threat that Lake Michigan and all the Great Lakes are facing. So we have something in common here. And my hope is that by joining together in this community and bringing some of these issues to the forefront, following the leadership of Chairman Miller, that we can find a solution not only for the Great Lakes, but also for the Port of Boston, for Boston Harbor, and for all of our waterways.

I understand that the Great Lakes may be more vulnerable in a way than Boston Harbor, because we have a flushing effect, if you will, because of the tides coming in and out, that the Great Lakes don't have that, that protective characteristic. And so it's even more important that we find a solution here to reduce the level of invasive species coming in, and also to prevent that from occurring in the future.

But the most significant source of invasive species is the ballast water that ships take on and discharge as they load and unload cargo. And it's important that shipping, while it is allowed to continue, and the Great Lakes communities as well as the east and west coast and the gulf coast rely heavily on shipping. Ships must be required to manage their ballast water to prevent the spread of invasive species to the fullest extent possible.

I'm interested in hearing—we have a great list of witnesses here. I'm interested in hearing what the Coast Guard plans to do to insure that Federal regulations are implemented in full effect, and

that they are strengthened to prevent the invasive species from compromising our waterways. I know this is a pressing problem for the Great Lakes and for other parts of the country, and we need Federal regulation, a sort of a blanket approach, to have a full core press on this type of danger.

There appear to be some technologies that are out there that show promise for preventing the transfer of invasive species. I'm looking forward to hearing from the witnesses today what kind of progress is being made in terms of that technology.

I'm also looking forward to hearing from the witnesses where they believe we can best focus our resources and efforts. Because if we focus on this problem as we should, I firmly believe that this is solvable. It's solvable. It's a matter of resources and of applying ourselves to the problem.

And I think under the leadership of Chairman Miller, we'll be able to do that. And I want to thank you, Madam Chair, and I yield back the balance of my time.

Mrs. MILLER. Thank you very much. And now I'd like to recognize Congressman Westmoreland for an opening statement.

Mr. WESTMORELAND. Thank you, Chairman Miller. And for all you people in this audience and school children watching, you'll probably get a sense of the different dialects across this country with Mr. Lynch and myself. It's probably from one end of the spectrum to the other.

But I want to thank Chairman Miller for doing this, and for allowing me to be on the subcommittee.

When I was first elected to Congress, I sat down next to Chairman Miller, and we were talking about different things, and started talking about government regulations. And she explained to me that she was going to be chairman of this subcommittee. I immediately went back to the office and wrote a letter requesting to be on the subcommittee, because I know she's got a heart to do the right thing. And in looking at some of the over regulations that we have in this country, and in this case what seems to be maybe some under regulation.

I, too, as Ranking Member Lynch, I have some ports. We have Savannah, Garden City, and Brunswick in Georgia. We too have the flushing effect that the Great Lakes don't have. But still, I think this needs to be an interest to us all.

This is going to be a learning opportunity for me. I have dealt with the shiny-rayed pocketbook mussel, which effects our water sources in Georgia, and Alabama, and in the South. I've never heard of the zebra mussels and some of these other invasive species that you have here. So I look forward to listening to the witnesses, especially listening to the Coast Guard on what their answers might be.

And I again thank Chairman Miller for giving me this opportunity to be here.

Mrs. MILLER. Thank you both. We appreciate that.

Now, because the Government Reform Committee is an oversight committee and has subpoena authority, it's our practice in Washington or field hearings to swear in all of our witnesses. So if you could please stand and raise your right hands?

[Witnesses sworn.]

Mrs. MILLER. Thank you very much.

Our first witness on our panel today that joins us, is our Attorney General Mike Cox. And we certainly do appreciate him joining with us today.

General Cox was sworn into office on January 1, 2003. He served in the U.S. Marines prior to receiving his law degree from the University of Michigan. Attorney General Cox began work at the Wayne County Prosecutor's Office in Detroit, where he prosecuted cases of organized crime. He actually tried over 125 jury trials, with a 90 percent conviction rate as well. He was appointed as the director of the Wayne County Prosecutor's Homicide Unit in 2002.

Under his leadership, the Michigan Attorney General's office has been extremely active in its efforts to protect the Great Lakes. In July 2004, Attorney General Cox helped lead an effort by the Great Lakes to improve the Federal Government's actions pertaining to ballast water. And I know he's filed several lawsuits in that regard, and has had some success on that. We'll be very interested to hear how all of that is going.

I am aware that you have a very busy schedule today, so if you would like to have us ask you questions at the conclusion of your statement, and then you can be on your way, or if you'd like to stay, certainly it's your call, sir, whatever your schedule permits. We're delighted to have you here.

STATEMENT OF MIKE COX, ATTORNEY GENERAL, STATE OF MICHIGAN

Mr. COX. Well, thank you, Chairman Miller, and thank you for having me here. I can make myself available. Whatever works for the committee, the best workings of the committee.

Thank you Anchor Bay Schools for welcoming us all here. And of course thank you, Congressman Lynch, for coming here; as well, Congressman Westmoreland.

You know, when we all discuss the pollution, I think most of us get a visual image in our mind here of what that means. And I expect that, Congressman Lynch, when you were back as an iron worker in south Boston, it might be urban smog, maybe for you that's the image of pollution; or Congressman Westmoreland, when you were a builder back in Georgia, maybe it was you're developing some land and you see some chemical waste in a pond. Or, for others it might be acid rain polluting a forest.

But for me, one of the strongest images of my life actually stems from when I was 7, 8 years old, back in the late 60's, early 70's, right not too far from here on Lake Huron, where we used to visit. I grew up in Detroit and I would go walking along the shores of Lake Huron, and there'd be alewives. And 2 weeks of every year, they'd wash up on the shore. And there would be masses of smelly dying alewives, which are not native invasive species to Michigan. They actually started off on the Atlantic coast in Maine.

And they were a huge problem for us back then. They were getting in the hatcheries of other native fish. And it wasn't until the State of Michigan, and I think it was the Federal Government also spent millions of dollars replacing and replenishing trout and salmon stock, which are predators of theirs, that we were able to get

the problem under control. And actually, now we've kind of reduced them to just being bait.

But nonetheless, it took a huge intervention of the State government in order to solve that problem of the invasive species coming here to the shores of our Great Lakes. And in my mind, that picture, that image, that's in my mind of pollution, because that is biological pollution.

And it's—you know, when we think of pollution in a polluted waterway, or other forms of pollution, generally over time pollution degrades and declines. Well, invasive species or aquatic nuisance species as we call them here in the State, they're a biological pollutant that does not decline or degrade. As a matter of fact, if not fought, they multiply, and they become a bigger problem.

You know today, as has been pointed out to you by Congressman Lynch, you know, invasive species, the species, aquatic nuisance species are carried in the ballast of larger ocean-going vessels. When they enter the Great Lakes, aquatic nuisance species wreak extraordinarily social, economic and ecological havoc here in Michigan, and all along the eight States of the Great Lakes. These biological pollutants not only threaten the Great Lakes' ecosystem, but they also pose a significant economic threat right here to the State of Michigan. Commercial and recreational fishing, boating, beaches, tourism, all suffer as a result of the harmful effects of these species.

The estimated annual costs of controlling just one aquatic nuisance species, the zebra mussels, in the Great Lakes that Congressman Westmoreland alluded to, is estimated anywhere between $100 and $400 million.

These aquatic nuisance species continue to enter the Great Lakes at, quite frankly, an alarming rate. Back in February 1999, President Clinton at that point thought it was a big enough problem that he issued an Executive order directing 10 Federal agencies to do—in essence, to do something about it. The Federal agencies have done little to prevent the introduction or further introduction of aquatic nuisance species via ballast water discharges even though it's some 6½ years that have passed.

In fact, since 1973, the EPA has exempted regulation of "discharges incidental to normal operation of a vessel" from the Clean Water Act's Normal Permit Discharge Elimination System Program. The agency, the EPA, applied this exemption to the ballast water discharges even though, as I said, these discharges introduce a biological pollutant.

Now as you're aware, the Coast Guard has been given authority to regulate ballast water discharges throughout what was originally the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990. However, this regulatory scheme has been ineffective and continues to be ineffective, primarily because the Coast Guard's existing rules only apply to vessels that carry ballast water. By the current practice, the Coast Guard allows ships to evade any treatment by declaring that they have no ballast on board, or the term of art is NOBOB. And seventy percent of the ships entering the Great Lakes, are NOBOB ships. And despite a claim of being a NOBOB vessel or ship, they still contain residual water and sludge that contains aquatic nuisance species.

In a 2005 report, the Great Lakes Environmental Research Lab concluded that NOBOB ships do introduce aquatic nuisance species to the Great Lakes. And the greatest threat of invasive species induction—excuse me, introduction to the Great Lakes, is ships with fresh or low salinity residual ballast water.

Thus, the Federal Governments actions have been completely unsuccessful. Biological pollutants continue to enter the Great Lakes because of the combination of EPA inaction and the Coast Guard's NOBOB exemption.

As of 2001, the Great Lakes Environmental Research Lab of the National Oceanic and Atmospheric Administration estimated that there were 162 aquatic nuisance species in the Great Lakes. That was as of 4 years ago. And at least 12 that entered since 1990.

On July 12, 2004, a petition was filed with the Coast Guard requesting rulemaking to close the NOBOB loophole. The Coast Guard solicited public comment, as is required, on the best way to address the NOBOB problem. And in July of this year, 2 months ago, stated it was developing a ballast water discharge standard to be used to approve ballast water treatment systems. Yet, thus far, it has not committed itself to any time line to adopt this.

Last week the Coast Guard issued best management practices for NOBOB vessels entering the Great Lakes. Unfortunately, though, this document is described as a policy. And the best management practices are only recommendations that cannot be enforced.

I do not believe the Coast Guard should be the primary Federal agency. Nonetheless, until—excuse me, in my mind, the Coast Guard should not be the primary agency, the EPA should. But until the EPA enacts much needed regulation, the Coast Guard should quickly close the NOBOB loophole. It is essential to the future of our Great Lakes that we close our borders literally to these invasive species.

My primary recommendation, however, as I alluded to, is that the EPA move quickly to regulate ballast water discharges under the Clean Water Act. In July 2004, my office, along with attorney generals from four other Great Lakes States, submitted the amicus brief in a lawsuit that was going on out in San Francisco, in the Federal Court there for the Northern District of California, arguing that the EPA's exemption for ballast water discharges was unlawful and should be repealed. The court ruled this past March, on March 31, 2005, that the EPA's exemption was without authority, and ordered the EPA to repeal the exemption. My office, along with other Great Lakes attorneys generals, has now been granted intervener status as parties, and we've asked the court for a short timeline to force the EPA to promulgate the final regulations.

However, in the interim, EPA has the authority right now to quickly develop general permits for classes of discharges. In addition, the EPA can require vessels to employ best management practices, such as ballast water exchange in the ocean, which is a generally beneficial management practice that can reduce the risk of invasive species of these biological pollutants right now.

The court will soon determine how the EPA's to regulate ballast water discharges under the Clean Water Act. While they wait for effective Federal action, States such as Michigan can and should be

able to try and slow down the explosion of these invasive species, of these aquatic nuisance species.

With my support, Michigan recently amended its primary water quality protection statute to require permits starting in January 2007. These permits will require all ocean-going vessels operating in Michigan ports, to show that they do not discharge aquatic nuisance species, or that they use environmentally sound technologies and methods to prevent the discharge of these invasive species in ballast water. In addition, the law creates a multi-state coalition which promotes existing laws that prohibit biological pollutants from being discharged. I supported this legislation, and I believe it is the best way currently available to protect the Great Lakes, given the lack of adequate Federal regulation.

And unfortunately Senate bill 363, which is talked about when we talk about this area of regulation, the Ballast Water Management Act of 2005, is currently being—as I said, it's currently being considered by the Senate Commerce Committee in Washington. Senate bill 363 would prohibit Michigan from imposing any requirement under its new State law that are inconsistent with Federal requirements. Senate bill 363 would also prohibit the EPA, the U.S. Environmental Protection Agency from regulating ballast water discharges under the Clean Water Act. In addition, new water treatment standards applying to all vessels wouldn't be required until 2016, some 11 years from now. Moreover, the bill would continue to keep—excuse me. The bill would keep current Coast Guard regulations for Great Lakes in place, including the NOBOB loophole, for at least a year.

I've joined other Great Lakes States' attorney generals in a joint letter conveying our problems, our dismay with the bill, especially since it would remove the Clean Water Act jurisdiction and would preclude States from acting where the Federal Government has not acted.

Our Great Lakes face devastating consequences if we continue to allow these biological pollutants to enter our waters unchecked. Michigan's citizens daily rely on the Great Lakes for recreation, for drinking water, for environmental benefits, and for its sustainable economic growth.

The Federal Government has failed to protect our natural resources from these devastating—from the devastating effects of these biological pollutants. Effective methods that address aquatic nuisance species are within our reach as a State and as a Nation. And I encourage all of us gathered here today to work together to see them implemented. We must act to protect our natural resources, so that our children do not have to remember the beaches of their childhood covered in rotting biological pollution.

That's the end of my prepared statement. But this morning when I woke up, if I can indulge—beg your indulgence for 2 more minutes. This morning when I woke up, I remembered—or, I read in the Detroit News, a local paper, on the first day of my vacation for this summer, which was August 14th. I was just hanging around Detroit, and I was going to take my kids fishing, and swimming, and that sort of stuff in the area.

At any rate, in the Sunday Detroit News, they had an article about foreign species crowding out local fish here in Michigan. And

it was really pretty interesting. I read the article, and I had to pull it out to bring here today.

And in this article from the Detroit News, and just 4 weeks ago, on the west side of Michigan we have the Lake Michigan. And Lake Michigan, a lot of the problems that happen in Lake Michigan, transfer over to inland lakes. Well, there's a town called Muskegon on the west—the west coast of Michigan, on Lake Michigan. And there's a Muskegon Lake, which historically was a great fishing area. For years and years, you could get perch and pickerel, and all sorts of fish out there.

At any rate, every year there's a guy there who started up a voluntarily fish tournament. And grew—this year there were 400 fisherman, and that he had organized friends and fellow fishermen. And they had a fishing contest. And, you know, it used to be that they would—they would try and get perch and pickerel and trout. Well, this year, these 400 anglers, these 400 fishermen caught 5,000 gobies, some 460 pounds of gobies, which are worthless as food for humans, and until the mid eighties, had never been seen in the Great Lakes. They've caught one perch. I think that dramatically outlines, better than my testimony could, this problem and the need for the Federal Government to do something about it.

Thank you very much.

Mrs. MILLER. Thank you, Attorney General Cox. We certainly appreciate your attendance.

[The prepared statement of Mr. Cox follows:]

Attorney General Ballast Water Testimony

Good afternoon and thank you Congresswoman Miller, Congressman Westmoreland, and Congressman Lynch for inviting me here today. I would also like to thank Anchor Bay High School for hosting this hearing.

When we discuss pollution, most of us probably think of smog, or chemical waste, or acid rain. But for me, the most memorable form of pollution stems from my trips as a young boy to Michigan's shores, and the stinking masses of rotting alewives that literally covered the beaches. Alewives are a non-native invasive species, and for years used to negatively affect Michigan's fisheries. For me, the memory of the alewives' littering the beaches is a powerful reminder of the very noticeable and undesirable impacts that biological pollutants can have on our Great Lakes, and why preventing their introduction is a duty that all of Michigan' s citizens share.

For the past two-and-a-half years, my office has undertaken efforts to protect the Great Lakes by preventing aquatic nuisance species from invading our delicate ecosystem. The prevention of these devastating biological pollutants is vital to preserving Michigan's waterways.

Carried in the ballast water of large oceangoing vessels when they enter the Great Lakes, aquatic nuisance species wreak extraordinary economic, social, and ecological havoc. These biological pollutants not only threaten the Great Lakes ecosystem, but also

pose a significant economic threat to the State of Michigan. Commercial and recreational fishing, boating, beaches, and tourism all suffer from the harmful effects of these species. The estimated annual cost of controlling one aquatic nuisance species – zebra mussels – in the Great Lakes is between $100 and $400 million[1]. These aquatic nuisance species continue to enter the Great Lakes at an alarming rate.

The Federal agencies have done little to prevent the introduction of aquatic nuisance species via ballast water discharges. Since 1973, the EPA has exempted by regulation "discharge[s] incidental to the normal operation of a vessel" from the Clean Water Act's National Permit Discharge Elimination System program. The agency applied this exemption to ballast water discharges, even though the discharges introduce biological pollutants.

As you are also aware the Coast Guard has been given the authority to regulate ballast water discharges through what was originally the Non-Indigenous Aquatic Nuisance Prevention and Control Act of 1990. However, this regulatory scheme has been ineffective, primarily because of a rule that allows ships to declare that they have no ballast on board (NOBOB) even when there may be residual water and sludge that could contain aquatic nuisance species. In a 2005 report[2], the Great Lakes Environmental Research Lab concluded that NOBOB ships do introduce aquatic nuisance species to the

[1] From a report on a joint hearing by the Subcommittee on Coast Guard and Maritime Transportation and Subcommittee on Water Resources and Environment, "Ballast Water Management: New International Standards and National Invasive Species Act Reauthorization," on March 25, 2004.
[2] Assessment of Transoceanic NOBOB Vessels and Low-Salinity Ballast Water as Vectors for Non-indigenous Species Introductions to the Great Lakes, Final Report co-managed by NOAA - GLERL, July 1, 2001-December 31, 2003.

Great Lakes, and the greatest threat of invasive species introduction to the Great Lakes is ships with fresh or low-salinity residual ballast water.

Thus, the federal government's actions have been completely unsuccessful. Biological pollutants continue to enter the Great Lakes because of a combination of EPA inaction and the Coast Guard's NOBOB exemption. As of 2001, the Great Lakes Environmental Research Lab of the National Oceanic and Atmospheric Administration estimated that there were 162 aquatic nuisance species in the Great Lakes, of which twelve had entered since 1990[3].

On July 12, 2004 a petition was filed with the Coast Guard requesting rulemaking to close the NOBOB loophole. The Coast Guard solicited public comment on the best way to address the NOBOB problem and, in July of this year, stated that it was developing a ballast water discharge standard to be used to approve ballast water treatment systems. So far it has not committed to any timeline. Last week, the Coast Guard issued best management practices for NOBOB vessels entering the Great Lakes. Unfortunately, this document is described as a policy and the best management practices are only recommendations that cannot be enforced. I do not believe the Coast Guard should be the primary federal agency, nonetheless, until the EPA enacts much needed regulation, the Coast Guard should quickly close the NOBOB loophole. It is essential to

[3] New Zealand mud snail, Quagga mussel, digenean fluke, cyclopoid copepod, digenean fluke, mixosporidian, amphipod, blueback herring, fish-hook waterflea, 2 types of harpacticoid copepod, and waterflea.

the future of our Great Lakes that we close our borders to these invading destructive biological pollutants.

My primary recommendation, however, is that the EPA move quickly to regulate ballast water discharges under the Clean Water Act. In July 2004, my office along with Attorneys General from five other Great Lakes States submitted an amicus brief in a lawsuit in the federal District Court for the Northern District Court of California arguing that the EPA's exemption for ballast water discharges was unlawful and should be repealed. The Court ruled on March 31st of this year that the EPA's exemption was without authority and ordered the EPA to repeal the exemption. My office along with the other Great Lakes Attorneys General has now been granted intervener status and will ask the Court for a short timeline for the EPA to promulgate final regulations.

In the interim, the EPA has the authority to quickly develop general permits for classes of discharges. In addition, the EPA can require vessels to employ best management practices such as ballast water exchange in the ocean, a generally beneficial management practice that can reduce the risk of introducing biological pollutants. The Court will soon determine how the EPA is to regulate ballast water discharges under the Clean Water Act. While they wait for effective federal action, states such as Michigan can and should be able to try to slow the explosion of aquatic nuisance species.

With my support, Michigan recently amended its primary water quality protection statute to require permits, starting in January 2007. These permits will require all

oceangoing vessels operating in Michigan's ports to show they do not discharge aquatic nuisance species or that they use "environmentally sound technology and methods" to prevent discharge of aquatic nuisance species in ballast water. In addition, the law creates a multi-state coalition[4] to promote existing laws that prohibit biological pollutants from being discharged. I supported this legislation and believe that it is the best way to protect the Great Lakes given the current lack of adequate federal regulation.

Unfortunately, Senate Bill 363, the "Ballast Water Management Act of 2005" is currently being considered by the Senate Commerce Committee. Senate Bill 363 would prohibit Michigan from imposing any requirements under its new state law that are inconsistent with federal requirements. Senate Bill 363 would also prohibit the United States Environmental Protection Agency from regulating ballast water discharges under the Clean Water Act. In addition, the new treatment standards will not apply to all vessels entering our waters until 2016. Moreover, the bill would keep the current Coast Guard regulations for the Great Lakes in place until the treatment standards go into effect, including the NOBOB loophole. I have joined other Great Lakes States' Attorneys General in a joint letter conveying our dismay that the bill would remove Clean Water Act jurisdiction and would preclude states from attempting to address the problem.

Our Great Lakes face devastating consequences if we continue to allow these biological pollutants to enter our waters unchecked. Michigan citizens daily rely on the Great Lakes for recreation, for drinking water, for environmental benefits, and for sustainable economic growth. The federal government has failed to protect our natural

[4] Great Lakes Aquatic Nuisance Species Coalition

resources from the devastating effects of biological pollutants. Effective methods to address aquatic nuisance species are within our reach as a State and as a nation, and I encourage all of us gathered here today to work together to see them implemented. We must act to protect our natural resources so that our children do not have to remember the beaches of their childhood covered in biological pollution.

Thank you.

Mrs. MILLER. And we will just proceed then with the rest of our witnesses, and if you can stay for questions, that would be very helpful for the panel here.

And in the interest of time, I might mention for the others, I've just been informed—actually, we have these little lights that we have set up here. When you see the red light, your 5 minutes is up. I'm not going to cut you off on your 5 minutes, but maybe you would like to try to roll through here a bit if we could.

Our next witness is Robin Nazzaro. And she is the Director with the Natural Resources and Environmental team of the U.S. Government Accountability Office. She's responsible for the GAO's work on Federal land management issues such as forest and wildfire management, invasive and endangered species, mining and grazing, national parks and recreation areas, and Indian affairs with the Department of the Interior and the Department of the Agriculture's Forest Service.

She has worked at the GAO since 1979, has demonstrated a wealth of audit experience, staff office service, and the diversity of issue area expertise. She has received numerous GAO honors, including the Comptroller General's Meritorious Service Award for sustained leadership, and two assisted Comptroller General Awards for exceptional contributions in strategic planning.

We certainly thank you for your presence today, and look forward to your testimony.

STATEMENT OF ROBIN M. NAZZARO, DIRECTOR, NATURAL RESOURCES AND ENVIRONMENT, GAO

Ms. NAZARENE. Thank you, Madam Chairman. Thank you, Madam Chairman and members of the subcommittee.

I'm pleased to be here today to discuss the Federal Government's response and actions taken to address the introduction of harmful species from ballast water in ships. Numerous harmful species have been introduced into U.S. waters from ballast water. These invasive non-native species have caused serious damage, that's been noted today, to ecosystems, businesses, and recreation.

GAO reported in 2002 that at least 160 non-native aquatic species have become established here in the Great Lakes since the 1800's. The ballast water used on ships to maintain safe operations, is considered a major source of these introductions. The effects are not trivial. The zebra mussel alone was estimated to have cost over $400—$750 million in costs between 1989 and 2000.

Today I will summarize the progress made in ballast water management, and discuss issues that pose challenges for the Federal Government's program for preventing the introduction of invasive species into U.S. waters from ships' ballast water.

In summary, the Federal Government has been taking numerous steps to address the introduction of potentially invasive species from ballast water in ships for well over a decade. In 1990, in response to the introduction of the zebra mussel, the Congress passed the Nonindigenous Nuisance Aquatic Prevention and Control Act. This act focused on preventing the introduction of organisms from ballast water into the Great Lakes. In 1996, the National Invasive Species Act re-authorized and amended the 1990 act, covering—ex-

panding coverage of ballast water management to all of the Nation's waters.

In response to these laws, the Coast Guard has developed a series of regulations that have called for both voluntarily and mandatory actions. The most important requirements include a call for ships to exchange their ballast water in the open ocean, at least 200 nautical miles from the shore. The law also allows ships to retain their ballast on board or to treat it with some other method than the exchange. However, as has been noted, no alternative methods have been approved for use, meaning that exchange is the current option for treating ballast water. As has been noted on the international front, the United Nation's International Maritime Organization has been working toward a global solution. In February 2004, the IMO adopted a convention on ballast water management. But at the moment, only one country has ratified this convention.

Despite the steps that have been taken, U.S. waters are still vulnerable to invasive species for several reasons. First, many ships with potentially harmful organisms in their ballast tanks are exempt from or are not covered by the mandatory regulations calling for ballast water exchange.

One category of ships not covered by the ballast water exchange requirement, are those without pumpable ballast on board, the so-called NOBOBs that have been mentioned today. These ships are of a particular concern for the Great Lakes, for about 80 percent of the ships that are entering from outside the 200 nautical mile zone fall into this category.

A second category of ships not covered by the requirement is those that do not travel more than 200 nautical miles from shore, such as ships traveling from one U.S. port to another, whether they be Georgia or Massachusetts, and those coming from foreign waters such as Central or South America.

Second, despite being authorized to do so, the Coast Guard has not established alternate discharge zones that could be used by ships that are unable to conduct ballast water exchanges.

Third, there are numerous concerns that ballast water exchange is not always effective at removing or killing potentially invasive species. Specifically, ballast pumps are not always able to remove all of the original water, sediment or associated organisms. In addition, elevated levels of salinity do not necessarily kill all forms of potentially invasive organisms.

Technologies are being developed that show some progress in providing more effective removal of potentially invasive species. Treatment options include water filtration systems, ultraviolet radiation, chlorine, heat, or ozone. However, the development of such technology is a daunting task, given the many operational constraints under which these technologies must operate on board ships.

The primary impediment to developing these technologies, however, is the lack of a discharge standard for how clean the ballast water must be. This standard would help developers determine how effective their technologies need to be. The Coast Guard has been working on the discharge standard for several years, but has not committed to an issuance date.

In conclusion, without this standard, or the development of additional technology, ballast water exchange is still the only available treatment method for reducing the amount of potentially invasive species in ships' ballast water. Thus, U.S. waters remain vulnerable to invasive species carried through this mechanism.

Madam Chairman, this concludes my statement. I would be pleased to answer any questions that you or members of the subcommittee may have.

Mrs. MILLER. Thank you very much.

[The prepared statement of Ms. Nazzaro follows:]

United States Government Accountability Office

GAO

Testimony

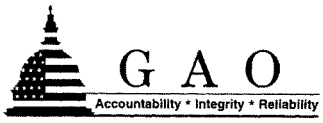
Before the Subcommittee on Regulatory Affairs, Committee on Government Reform, United States House of Representatives

For Release on Delivery
2 p.m. Friday September 9, 2005

INVASIVE SPECIES

Progress and Challenges in Preventing Introduction into U.S. Waters Via the Ballast Water in Ships

Statement of Robin M. Nazzaro, Director
Natural Resources and Environment



GAO-05-1026T

September 9, 2005

GAO
Accountability · Integrity · Reliability
Highlights

Highlights of GAO-05-1026T, a testimony before the Subcommittee on Regulatory Affairs, Committee on Government Reform, United States House of Representatives

INVASIVE SPECIES

Progress and Challenges in Preventing Introduction into U.S. Waters Via the Ballast Water in Ships

Why GAO Did This Study

Numerous invasive species have been introduced into U.S. waters via ballast water discharged from ships and have caused serious economic and ecologic damage. GAO reported in 2002 that at least 160 nonnative aquatic species had become established in the Great Lakes since the 1800s—one-third of which were introduced in the past 30 years by ballast water and other sources. The effects of such species are not trivial; the zebra mussel alone is estimated to have caused $750 million to $1 billion in costs between 1989 and 2000. Species introductions via ballast water are not confined to the Great Lakes, however. The environment and economy of the Chesapeake Bay, San Francisco Bay, Puget Sound, and other U.S. waters have also been adversely affected.

The federal government has been taking steps since 1990 to implement programs to prevent the introduction of invasive species from ships' ballast water discharges. However, species introductions are continuing.

This testimony discusses the legislative and regulatory history of ballast water management and identifies some of the issues that pose challenges for the federal government's program for preventing the introduction of invasive species via ships' ballast water.

www.gao.gov/cgi-bin/getrpt?GAO-05-1026T.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Robin Nazzaro, (202) 512-3841 or nazzaror@gao.gov.

What GAO Found

Congress recognized ballast water as a serious problem in 1990 with passage of the Nonindigenous Aquatic Nuisance Prevention and Control Act, legislation intended to help reduce the number of species introductions in the Great Lakes. A reauthorization of this law in 1996, the National Invasive Species Act, elevated ballast water management to a national level. As directed by the legislation, the federal government has promulgated several regulations requiring certain ships to take steps, such as exchanging their ballast water in the open ocean to flush it of potentially harmful organisms, to reduce the likelihood of species invasions via ballast water. Initially these regulations applied only to certain ships entering the Great Lakes; now they apply to certain ships entering all U.S. ports. In addition to these domestic developments, the United Nation's International Maritime Organization has recently adopted a convention on ballast water management that could affect the global fleet.

Since 1998, Coast Guard data show that compliance with existing ballast water exchange requirements has generally been high. However, key agencies and stakeholders recognize that the current ballast water exchange program is not a viable long-term approach to minimizing the risks posed by ballast water discharges. The primary reasons for this are that:

- many ships are exempt from current ballast water exchange requirements,
- the Coast Guard has not established alternate discharge zones that could be used by ships unable to conduct ballast water exchange for various reasons, and
- ballast water exchange is not always effective at removing or killing potentially invasive species.

Developers are pursuing technologies to provide more reliable alternatives to ballast water exchange, some of which show promise. However, development of such technologies and their eventual use to meet ballast water regulatory requirements face many challenges including the daunting technological task of developing large scale water treatment systems that ships can accommodate, and the lack of a federal discharge standard that would provide a target for developers to aim for in terms of treatment efficiency. As a result, ballast water exchange is still the only approved method for treating ballast water despite the concerns with this method's effectiveness. Consequently, U.S. waters remain vulnerable to the introduction of invasive species via ships' ballast water. State governments and others have expressed frustration over the seemingly slow progress the federal government has made on more effectively protecting U.S. waters from future species invasions via ballast water. As a result, several states have passed legislation that authorizes procedures for managing ballast water that are stricter than federal regulations.

Madam Chairman and Members of the Subcommittee:

I am pleased to be here today to discuss actions to address the introduction of harmful invasive species via the ballast water in ships. Numerous harmful species have been introduced into U.S. waters via ballast water and have caused serious economic and ecologic damage. As you know, many of these species are now permanent residents in U.S. ecosystems and have significantly altered the structure of these systems, or promise to do so in the future. We reported in 2002 that at least 160 nonnative aquatic species had become established in the Great Lakes since the 1800s, more than one-third of which had been introduced in the prior 30 years. Ballast water is considered a major, although not the only, source of those introductions.[1] This problem is not confined to the Great Lakes, however. The environment and economy of the Chesapeake Bay, San Francisco Bay, Puget Sound, and other coastal areas have also been affected by species transported in ballast water. The effects are not trivial; the zebra mussel alone is estimated to have caused $750 million to $1 billion in costs between 1989 and 2000.[2]

Today, I am going to provide some information on the legislative and regulatory history of ballast water management and discuss some issues that pose challenges for the federal government's program for preventing the introduction of invasive species into U.S. waters from ships' ballast water discharges, including an update on concerns that we identified in our 2002 report.

To update our work from 2002, we examined relevant statutes, regulations, and agency policies and documents. We also gathered recent data on compliance with current regulations. In addition, we interviewed agency officials and representatives of the shipping industry, technology developers, state agencies, environmental organizations, and academic researchers. We conducted our work from March through August 2005 in accordance with generally accepted government auditing standards.

Summary

In summary, ballast water as a potential source of invasive species has been a legislative concern since 1990, first with passage of the Nonindigenous Aquatic Nuisance Prevention and Control Act, and again with an amendment in 1996 that expanded management of the problem. The Coast Guard has promulgated several guidelines and regulations since 1991 concerning certain ballast water management activities. Initially these activities were only required of certain ships traveling into the Great Lakes and the Hudson River. Now, such activities are required of certain ships entering all U.S. ports. Also during this period, the international shipping community—via the International Maritime Organization—has been working on reaching agreement on ballast water management standards to apply to all shipping worldwide. The organization recently adopted a convention on this issue, although the convention has not been ratified by enough countries for it to enter into force.

---

[1] GAO, *Invasive Species: Clearer Focus and Greater Commitment Needed to Effectively Manage the Problem*, GAO-03-1 (Washington, D.C.: Oct. 22, 2002), 12.
[2] Carlton, J.T., *Introduced Species in U.S. Coastal Waters: Environmental Impacts and Management Priorities*, (Arlington, VA: Pew Oceans Commission, 2001).

We reported in 2002 that despite such steps—and generally high compliance rates with existing ballast water management regulations—U.S. waters were still vulnerable to species invasions. In particular, we reported that some ships were not required to conduct ballast water exchange and that exchange was not necessarily effective at removing potentially invasive species from ships' ballast water. At the time, key agencies and stakeholders recognized that ballast water exchange was not a viable long-term approach to minimizing the risks posed by ballast water discharges. This sentiment continues today.

A key element of an improved management program for preventing species invasions is the development of a discharge standard for ballast water. When we reported in 2002, the Coast Guard was working on a discharge standard that would set a limit on the amount of potentially harmful organisms that could be discharged by ships into U.S. waters. In addition, developers were researching technologies that could be used to more effectively "clean" ballast water discharges than ballast water exchange. However, at the time, it was not clear what type of technological approach would prove successful at treating ballast water. While progress has been made on both of these issues since our report, the bottom line remains the same. Specifically, the Coast Guard has yet to issue a discharge standard and there are no technologies that have been approved for treating ballast water. Without such a standard or technology, ballast water exchange is still the only available treatment method for reducing the amount of potentially invasive species in ships' ballast water. Thus, U.S. waters remain vulnerable to invasive species carried in ballast water. In the absence of a stronger federal program for protecting U.S. waters against species invasions, several states including Michigan, have passed legislation addressing various aspects of the problem.

Background

Species of plants, animals, and microscopic organisms are transported from their native environments around the world to new locations in many different ways, both intentionally and unintentionally. When they arrive in a new location, most of these species do not survive because environmental conditions are not favorable. However, some of the newly arrived species do survive and, unfortunately, a portion of these flourish to the point that they begin to dominate native species and are thus labeled as "invasive." These invasive, nonnative species can seriously damage ecosystems, businesses, and recreation.

Ballast water is one of many pathways by which nonnative and invasive species have arrived in the United States. Ships are designed to sail safely with their hulls submerged to a certain depth in the water. If a ship is not filled to capacity with cargo, it needs to fill its ballast tanks with water to maintain proper depth and balance during its travels. As a ship takes on cargo at ports of call, it must then discharge some of its ballast water to compensate for the weight of the cargo. When ships are fully loaded with cargo, their ballast tanks may be pumped down to the point where only residual water (also referred to as non-pumpable ballast water) is left. Ship masters may also manipulate the amount of water in their ballast tanks to account for different sea conditions. Different classes

of ships have different ballast capacities, ranging from tens of thousands to millions of gallons of water.

Ships generally fill and discharge their ballast tanks when they are in port, and the water and associated sediment they take in is likely to contain living organisms or their eggs. Because the ballast water may be fresh, brackish, or salty depending on where it is obtained, the organisms in the water will also vary accordingly. Worldwide, ships discharge an estimated 3 billion to 5 billion metric tons of ballast water each year, and it is estimated that several thousand different species may be transported globally in ballast tanks on any given day. Well-known examples of invasive species brought to the United States in ballast tanks include the zebra mussel, round goby, Japanese shore crab, Asian clam, and Black Sea jellyfish. Collectively, these and other aquatic species transported in ballast water have caused billions of dollars in damage to our economy and unmeasured damage to the environment. For example, we reported in 2002 that the Great Lakes commercial and recreational fishing industry—which is worth about $4.5 billion annually—was being damaged or threatened by the sea lamprey, round goby, Eurasian ruffe, and two invertebrates from eastern Europe, just to name a few.

While the Great Lakes feature prominently in today's hearing, many other waters around the United States have also been invaded by harmful species. Notably, invasive species are found in virtually all of our coastal bays and estuaries—resources that are typically enormously productive and support multibillion dollar commercial fisheries and recreation industries. Given the pace and expansion of global trade, the movement of additional invasive species to these and other ecosystems can only be expected to continue.

History of Ballast Water Management

The federal government has been taking steps to address the introduction of potentially invasive species via the ballast water in ships for well over a decade. Congress recognized ballast water as a serious problem in 1990 with the passage of the Nonindigenous Aquatic Nuisance Prevention and Control Act, legislation intended to help reduce the number of species introduced into U.S. waters, focusing on the Great Lakes. Congress reauthorized appropriations for and amended that law in 1996, making it more national in scope. In 1999, the President issued an executive order to better address invasive species in general, including those transported in ballast water. In addition to these domestic developments, members of the United Nation's International Maritime Organization have adopted a convention on ballast water management that, if ratified by a sufficient number of countries, could affect the global fleet.

Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990

Ballast water as a conduit for invasive species was first legislatively recognized in 1990 with the passage of the Nonindigenous Aquatic Nuisance Prevention and Control Act (NANPCA).[3] This law was a response to the introduction of the zebra mussel in the

[3] Pub. L. 101-646, 104 Stat. 4761 (1990), codified at 16 U.S.C. §§4701-4751.

Great Lakes and findings that the discharge of ballast water results in unintentional introductions of nonindigenous species. The zebra mussel reproduces rapidly, and soon after its introduction clogged municipal and industrial water pipes, out-competed native mussels for food and habitat, and cost millions of dollars in economic losses and remedial actions.

Specifically, NANPCA called for regulations to prevent the introduction and spread of aquatic invasive species into the Great Lakes through the ballast water of ships.[4] Among other things, it specifically called for the regulations to require ships carrying ballast water and entering a Great Lakes port after operating beyond the Exclusive Economic Zone (EEZ)—a zone generally extending 200 nautical miles from a country's shores—to take one of the following actions:

- Carry out what is known as ballast water exchange beyond the EEZ before entering a Great Lakes port;
- Exchange ballast water in other waters where the exchange does not threaten introduction of aquatic invasive species to the Great Lakes or other U.S. waters; or
- Use an environmentally sound alternative method of removing potentially invasive organisms if the Secretary determines that such method is as effective as ballast water exchange in preventing and controlling aquatic invasive species infestations.

Exchanging ballast water in the ocean serves two purposes—to physically flush aquatic organisms from ships' tanks and to kill remaining organisms that require fresh or brackish water with highly saline ocean water.

After first issuing guidelines that became effective in March 1991, the Coast Guard replaced them with ballast water management regulations in April 1993 for ships carrying ballast water and entering the Great Lakes from outside of the EEZ.[5] In 1992, Congress amended NANPCA and called for the promulgation of regulations for ships entering the Hudson River north of the George Washington Bridge; in December 1994, the Coast Guard extended its regulations to these ships.[6] The regulations required ships with pumpable ballast water to:

- exchange ballast water beyond the EEZ at a minimum depth of 2,000 meters before entering the Great Lakes or Hudson River;[7]
- utilize another environmentally sound ballast water management method approved by the Coast Guard; or
- retain the ballast water on board.

---

[4] The law called for regulations to be issued by the Secretary of the department in which the Coast Guard was operating. At the time, the Coast Guard was within the Department of Transportation; it is now within the Department of Homeland Security. Throughout this report, unless otherwise indicated, we use the term "Secretary" to refer to the Secretary of the department in which the Coast Guard is operating.

[5] 58 *Fed. Reg.* 18,330 (Apr. 8, 1993).

[6] 59 *Fed. Reg.* 67,632 (Dec. 30, 1994).

[7] The Coast Guard later removed the depth requirement. See 64 *Fed. Reg.* 26,672 (July 28, 2004).

The Coast Guard did not approve any alternative method and, therefore, ships that did not exchange their ballast water beyond the EEZ were required to retain it on board. The Coast Guard also required these ships to submit reports attesting to, among other things, their ballast water management actions.

NANPCA also established the Aquatic Nuisance Species Task Force (ANSTF), consisting of representatives from the U.S. Fish and Wildlife Service, the National Oceanic and Atmospheric Administration (NOAA), the Environmental Protection Agency (EPA), the Coast Guard, the Army Corps of Engineers, and other agencies deemed appropriate, as well as ex-officio members from the Great Lakes Commission and other nonfederal groups or agencies.[8] NANPCA required the task force and the Secretary to cooperate in conducting a number of studies within 18 months of enactment of the act on such issues as:

- The environmental effects of ballast water exchange on native species in U.S. waters;
- Alternate areas, if any, where ballast water exchange does not pose a threat of infestation or spread of aquatic invasive species in the Great Lakes and other U.S. waters;
- The need for controls on ships entering U.S. waters other than the Great Lakes to minimize the risk of unintentional introduction and dispersal of aquatic invasive species in those waters; and,
- Whether aquatic invasive species threaten the ecological characteristics and economic uses of U.S. waters other than the Great Lakes.

National Invasive Species Act of 1996

Recognizing that many water bodies around the country in addition to the Great Lakes had been invaded by harmful, nonindigenous aquatic species, Congress reauthorized appropriations for and amended NANPCA with the passage of the National Invasive Species Act of 1996 (NISA).[9] NISA expanded upon NANCPA and called for voluntary national guidelines for ships equipped with ballast water tanks that operate in waters of the United States. NISA required the voluntary guidelines to direct ships to manage ballast water in a manner similar to the mandatory requirements for ships sailing to the Great Lakes by conducting ballast water exchange beyond the EEZ, exchanging their ballast water in an alternative discharge zone recommended by the ANSTF, or using an alternative treatment method approved by the Secretary. The law also required that the guidelines direct ships to carry out other management practices that were deemed necessary to reduce the probability of transferring species from ship operations other than ballast discharge and from ballasting practices of ships that enter U.S. waters with no ballast water on board. In addition, the law required that the guidelines provide that ships keep records and submit them to the Secretary to enable the Secretary to determine compliance with the guidelines.

[8] The general mission of the task force is to develop and implement a program for the waters of the United States to prevent introduction and dispersal of aquatic invasive species; to monitor, control, and study such species; and to disseminate related information. This mission is not confined to species transported in ballast water.

[9] Pub. L. No. 104-332, 110 Stat. 4073 (1996).

The Coast Guard issued an interim rule in May 1999 and promulgated a final rule in November 2001 setting forth national voluntary guidelines under NISA.[10] The guidelines encouraged ships carrying ballast water taken on in areas less than 200 nautical miles from any shore or in waters less than 2,000 meters deep to employ at least one of the following ballast water management practices: exchange their ballast water outside of the EEZ in waters at least 2,000 meters deep before entering U.S. waters, retain it on board, use an approved alternative ballast water management method, discharge the ballast water to an approved reception facility, or under extraordinary conditions conduct an exchange in an area agreed to by the Captain of the Port.[11] The voluntary guidelines also encouraged all ships equipped with ballast water tanks and operating in U.S. waters to take various precautions to minimize the uptake and release of harmful aquatic organisms, pathogens and sediments. Such precautions may include regularly cleaning ballast tanks to remove sediment and minimizing or avoiding the uptake of ballast water in areas known to have infestations of harmful organisms and pathogens such as toxic algal blooms. In issuing the voluntary guidelines, the Coast Guard said that it was considering the results of a study on alternate discharge exchange zones but had not decided whether to allow ballast water exchanges in any of the possible locations the task force identified.

NISA also required a report to Congress on, among other things, compliance with the voluntary ballast water exchange and reporting guidelines no later than 3 years after their issuance. In addition, NISA required that the guidelines be revised, or additional regulations promulgated, no later than 3 years after the issuance of the guidelines and at least every 3 years thereafter, as necessary. Importantly, NISA required the promulgation of regulations making the guidelines mandatory if the Secretary determined that reporting or the rate of ship compliance was not adequate. As required by NISA, the Coast Guard issued its report to Congress in June 2002, but was not able to evaluate compliance with the voluntary guidelines because the rate of reporting was so poor. (From July 1, 1999, to June 30, 2001, less than one-third of all vessels required to report ballast water management information met the requirement.) Accordingly, as authorized by NISA, the Coast Guard published a proposed rule for a national mandatory program for ballast water management for all ships operating in U.S. waters in July 2003 and a final rule in July 2004.[12] In addition, the Coast Guard promulgated another rule,

[10] 64 *Fed. Reg.* 26,672 (May 17, 1999); 66 Fed. *Reg.* 58,381 (Nov. 21, 2001). The voluntary guidelines also encourage ships with ballast tanks operating in U.S. waters to take other actions including: avoiding discharge or uptake of ballast water in areas within or affecting marine sanctuaries, preserves, parks, or coral reefs; minimizing or avoiding uptake in areas near sewage outfalls, near dredging operations, in darkness, where sediment may be stirred up by propellers, or where tidal flushing is known to be poor or times when a tidal stream is known to be more turbid; rinsing anchors and chains; and regularly removing fouling organisms from hulls, piping, and tanks.

[11] The Captain of the Port, in American waters, is a U.S. Coast Guard officer who is responsible for Coast Guard law enforcement activities in his area of responsibility. A Captain of the Port enforces regulations for the protection and security of vessels, harbors, and waterfront facilities; anchorages; bridges; safety and security zones; and ports and waterways.

[12] 68 *Fed. Reg.* 44,691 (July 30, 2002) and 69 *Fed. Reg.* 44,952 (July 28, 2004). The final rule removed the provision contained in the voluntary guidelines that suggested ballast water exchange be conducted in waters at least 2,000 meters deep.

effective August 13, 2004, establishing penalties for, among other things, ship owners who do not file the required reports on their ballast water operations.[13]

Finally, a key provision in NISA recognized the need to stimulate development of ballast water treatment technologies. Specifically, NISA called for the establishment of a grant program to provide funds to nonfederal entities to develop, test, and demonstrate ballast water treatment technologies. The Secretary of the Interior was authorized to enter into cooperative agreements with other federal agencies and nonfederal entities to conduct the program. NOAA and the U.S. Fish and Wildlife Service created the Ballast Water Technology Demonstration Program that provides grants to entities pursuing technologies that could be used to treat ballast water.

National Invasive Species Council

Addressing concerns with the introduction of potentially harmful organisms via ballast water also falls under the purview of the National Invasive Species Council. The council was created in 1999 under Executive Order 13112, which broadly addressed all types of invasive species. The council consists of the heads of the principal departments and agencies with invasive species responsibilities. The order directed the council to develop a plan for managing invasive species across agencies and to do so through a public process in consultation with federal agencies and stakeholders.

The council issued a national invasive species management plan in January 2001 containing 57 primary action items calling for about 168 separate actions to be taken by a variety of federal agencies. Two actions in the plan relate to ballast water. First, because ballast water exchange was recognized as only an interim measure to address nonnative species introductions via ballast water, the plan called for NOAA, the Coast Guard, Interior, and EPA to sponsor research to develop new technologies for ballast water management by July 2001. Second, the plan called for the Coast Guard to issue standards for approving the use of ballast water management technologies as alternative ballast water management methods by January 2002. NANPCA and NISA require that, in order for an alternative ballast water management method to be used, the Secretary must first approve the method as being "at least as effective as ballast water exchange in preventing and controlling infestations of aquatic nuisance species," however, standards for approving alternative measures had yet to be developed.

The effect of the National Invasive Species Council and the national management plan on efforts to address species introductions via ballast water appears to be minimal. While research on technologies has been supported by the Ballast Water Technology Demonstration Program, which is managed by NOAA and the Fish and Wildlife Service, this program began in 1998 in response to NISA—before the management plan was written or before the council was even created. Little action has been taken on developing standards for approving ballast water treatment technologies even though its completion date was January 2002.

[13] 69 *Fed. Reg.* 32,864 (June 14, 2004).

The council has focused on ballast water in its "cross-cut budget" for invasive species that it began in 2002 (for the fiscal year 2004 budget), although its influence on ballast water management also appears limited. The cross-cut budget effort is intended to encourage agencies to, among other things, develop shared goals and strategies, and to promote cooperation and coordination on invasive species issues. As a part of the cross-cut budget, agencies have developed three performance measures for ballast water management. For fiscal year 2005, agencies were to (1) sponsor eight ballast water technology projects, (2) develop and implement a standardized program to test and certify the performance capabilities of ballast water treatment systems, and (3) conduct a pilot scale verification trial of a full-scale treatment system to validate the standardized program. However, these measures call for agencies to take certain actions as opposed to achieving some desired outcome. This is similar to what we observed in our 2002 report about the actions in the national management plan. In addition, we note that the Coast Guard is not included in the cross-cut budget for ballast water despite being the primary regulatory agency for managing this issue.

International Maritime Organization Convention on Ballast Water

While Congress, the Coast Guard, and other federal agencies have sought to reduce the threats posed by ballast water through domestic regulation, the United Nation's International Maritime Organization (IMO) has worked for over 10 years toward a global solution to the problem.[14] In February 2004, IMO member countries adopted the International Convention for the Control and Management of Ships' Ballast Water and Sediments.[15] The convention calls for ballast water exchange as an interim measure. This would be followed by the imposition of a treatment standard that would place limits on the number of organisms that ships could discharge in their ballast. To enter into force, the convention must be ratified by at least 30 countries constituting at least 35 percent of the gross tonnage of the world's merchant shipping. As of August 2005, eight countries had signed the convention but only one—the Maldives—had ratified it.[16]

The convention's ballast water performance standard would require ships conducting ballast water management to discharge less than 10 viable organisms greater than or equal to 50 microns in size per cubic meter of water and less than 10 viable organisms less than 50 but greater than 10 microns in size per milliliter of water.[17] In addition, the

[14] The IMO is an organization of 160 member countries with observers from governmental, industry, environmental, public interest, and labor organizations that is concerned with the safety of shipping and cleaner oceans. To achieve its objectives, the IMO has promoted the adoption of some 30 conventions and protocols, and has adopted well over 700 codes and recommendations concerning maritime safety, the prevention of pollution, and related matters.

[15] The adoption of a convention marks the conclusion of only the first stage of a long process. Before the convention comes into force, that is before it becomes binding upon governments that have ratified it, it has to be accepted formally by individual governments.

[16] The seven are Argentina, Australia, Brazil, Finland, the Netherlands, Spain, and the Syrian Arabic Republic.

[17] A micron is one millionth of a meter in length. A milliliter is one thousandth of a liter. To provide some context on the number of organisms this would allow, large ships may carry over 60,000 cubic meters of ballast water. This means that under the IMO standard, a ship discharging that amount of ballast water

ballast water performance standard would set limits on the discharge of several disease causing pathogens including cholera and *E. coli.* The dates by which ships would need to meet the ballast water performance standard, if the convention enters into force, would depend upon when the ship was built and what its ballast water capacity is. For example, the ships first required to meet the standard would be those built in 2009 or later with a ballast capacity of less than 5,000 cubic meters. Ships built before 2009 with a ballast capacity between 1,500 cubic meters and 5,000 cubic meters would have to meet the standard by 2014. Regardless of age or size, all ships subject to the convention would need to meet the standard by 2016.

Major Issues with Current Ballast Water Management Program

The federal government has continued to take steps to strengthen controls over ballast water as a conduit for potentially harmful organisms. Since 1998, Coast Guard data show that compliance with conducting ballast water exchange, when required, has generally been high. However, key agencies and stakeholders recognize that the recently adopted mandatory national program for ballast water exchange is not a viable long-term approach to minimizing the risks posed by ballast water discharges. Major limitations with this approach include the fact that despite relatively high compliance rates with the regulations, U.S. waters remain vulnerable to species invasions because many ships are still not required to conduct ballast water exchange. In addition, the ANSTF has not recommended alternate areas for ballast water exchange and thus, the Coast Guard has not established alternate discharge zones that could be used by ships. And lastly, ballast water exchange is not always effective at removing or killing potentially harmful species.

Compliance with Existing Ballast Water Exchange Is Generally High

With the Coast Guard's mandatory ballast water management regulation for ships traveling into U.S. waters after operating beyond the EEZ and carrying ballast water taken on less than 200 nautical miles from shore—effective September 2004—more ships are generally required to conduct ballast water exchange or retain their ballast water than before. We noted in 2002 that compliance with ballast water exchange requirements for ships entering the Great Lakes was high, and the Coast Guard maintains that it remains high. According to the Coast Guard, from 1998 through 2004, 93 percent of the ships entering the Great Lakes with pumpable ballast water were in compliance with the exchange requirement. More recently, data show that about 70 percent of those arriving from outside the EEZ to ports other than the Great Lakes conducted an exchange. Most notably, reporting on ballast water management activities has increased dramatically. According to the Coast Guard, reporting increased from approximately 800 reports per month in January 2004 to over 8,000 per month since September 2004; this reflects reporting from about 75 percent of ships arriving from outside the EEZ. The Coast Guard attributes the increase in reporting to an effort beginning in 2004 to encourage ship masters to file reports electronically and to the new regulations that allow the Coast Guard to levy penalties for non-reporting. According to data provided by

---

could legally discharge up to 600,000 organisms measuring more than 50 microns and 600 billion organisms measuring less than 50 microns.

the Coast Guard, nearly five percent of ships arriving at U.S. ports between January 2005 and July 2005 were inspected for compliance with ballast water regulations. On the basis of its inspections, the Coast Guard reports a 96.5 percent compliance rate with the mandatory ballast water management regulations. During the first two quarters of 2005, inspections revealed 124 deficiencies that range from problems with ballast water management reporting to illegal discharge of ballast water in U.S. waters. As a result of these findings, Coast Guard took nine enforcement actions.

Many Ships with Potentially Harmful Organisms in Their Ballast Water Are Not Required to Conduct Ballast Water Exchange or Retain Their Ballast Water

Although the Coast Guard believes that compliance with ballast water management regulations is high, U.S. waters may still not be adequately protected because many ships are not required to conduct ballast water exchange even though they may discharge ballast water in U.S. waters.

NOBOBs. Ships with no ballast water in their tanks (referred to as "no ballast on board" ships or NOBOBs) are not required to conduct ballast water exchange or retain their ballast water.[18] While the term "NOBOB" indicates that a ship has no ballast on board, these ships may, in fact, still be carrying thousands of gallons of residual ballast water and tons of sediment that cannot be easily pumped out because of the design of their tanks and pumps. This water and sediment could harbor potentially invasive organisms from previous ports of call that could be discharged to U.S. waters during subsequent ballast discharges. NOBOBs are a particular concern in the Great Lakes, where greater than 80 percent of ships entering from outside the EEZ fall into this category. While still a concern for other U.S. ports, it appears that a significantly smaller portion (about 20 percent) of ships arriving at U.S. ports other than the Great Lakes from beyond the EEZ claimed NOBOB status. Officials responsible for gathering and managing data on ship arrivals estimate that about 5 percent of those NOBOB ships take on ballast water and discharge it in U.S. waters.

When the Coast Guard conducted an environmental assessment of its new national mandatory ballast water exchange regulations in 2003, it did not review the potential threat that NOBOB ships pose to future species invasions, although it received comments raising concerns about this omission. In response to comments on its 2004 rule, the agency noted that NOBOBs were required to submit ballast water reporting forms, that it would continue to explore the issue of NOBOBs, and that these vessels may be included in a future rulemaking. In May 2005, the Coast Guard convened a public workshop in Cleveland to discuss and obtain comments on NOBOBs, particularly as they affect the Great Lakes. Following the public meeting, the Coast Guard held a closed meeting for an invited group of government officials and technology experts. The overall purpose of the closed meeting was to discuss technological approaches that are now

[18] Since 2004, NOBOBs have been required to comply with other ballast water management practices listed at 33 CFR §151.2035(a), which includes practices such as rinsing anchors and chains and avoiding ballast water uptake near sewage outfalls.

available or soon to be available to address the potentially invasive organisms in NOBOB ships. The agency has not published any record of the closed meeting.

The Coast Guard just issued a notice, published in the *Federal Register* on August 31, 2005, containing a voluntary management practice for NOBOBs that enter the Great Lakes and have not conducted ballast water exchange.[19] This practice indicates that such ships should conduct salt water flushing of their empty ballast tanks in an area 200 nautical miles from any shore, whenever possible. Salt water flushing is defined as "the addition of mid-ocean water to empty ballast water tanks; the mixing of the flush water with residual water and sediment through the motion of the vessel; and the discharge of the mixed water, such that the resultant residual water remaining in the tank has as high a salinity as possible, and preferably is greater than 30 parts per thousand." Scientists believe that this process will either flush out residual organisms from the ballast tanks or kill remaining organisms with highly saline ocean water. The effectiveness of this process, however, has not been demonstrated. A Coast Guard official in the ballast water program explained that issuance of voluntary best management practices were favored over regulations because of the relative speed with which they can be issued.

Coastal Traffic. Ships traveling along U.S. coasts that do not travel farther than 200 nautical miles from any shore are also not required to conduct ballast water exchange or to retain their ballast water. One such group of ships includes those that travel within the EEZ from one U.S. port to another, such as from the Gulf of Mexico to the Chesapeake Bay. However, these ships may act as a vector for unwanted organisms between ports. The second group of ships falling in this category includes those that come from foreign ports but do not travel more than 200 nautical miles from any shore. These can include ships arriving from the Caribbean, Central America, South America, Panama Canal, and Canada. The Coast Guard regulations explicitly exempt ships traveling within 200 nautical miles of any shore from conducting ballast water exchange. However, these ships also represent a possible conduit for invasive species. Approximately 65 percent of ships arriving at U.S. ports from outside the EEZ—over 28,000 in 2003—do not travel more than 200 nautical miles from shore.[20]

Key stakeholders have raised concerns about this gap in regulatory coverage over coastal traffic. For example, in commenting on the Coast Guard's proposed regulations for national mandatory ballast water exchange, NOAA, the Fish and Wildlife Service, the states of Washington and Pennsylvania, the Northeast Aquatic Nuisance Species Task Force, a state port association, and environmental advocacy organizations expressed concern that coastal traffic was not addressed by the rulemaking. The Coast Guard has also acknowledged this gap. Specifically, the agency noted in its July 2003 assessment of the potential impacts of its new regulations on mandatory ballast water exchange and in its environmental assessment of the final regulations, that discharges from coastal shipping could result in the introduction or spread of invasive species within regions of

[19] 70 *Fed. Reg.* 51,831 (Aug. 31, 2005).
[20] *Shipping Traffic Analysis and Cost Assessment for Ballast Water Exchange En Route to the United States—an analysis revisited*, U.S. Department of Homeland Security, September 2004.

the United States.[21] However, the agency did not quantify the additional risks posed by coastal traffic nor did it discuss what should be done to mitigate those risks.

No Alternate Exchange Zones Have Been Designated

Several of the issues described above revolve around the requirement that ballast water exchange be done at least 200 nautical miles from shore. However, Congress recognized that there might be areas within the 200-nautical mile limit of the EEZ in which ballast water exchange might not be harmful.[22] Congress required the Aquatic Nuisance Species Task Force to conduct a study to identify any possible areas within the waters of the United States and the EEZ where ballast water exchange would not pose a threat of infestation or spread of aquatic invasive species. NANPCA, as amended by NISA, called upon the Coast Guard regulations and guidelines to allow or encourage ships to exchange ballast water in alternate locations, based on the Task Force's recommendations. The required study on alternate exchange areas was delivered to NOAA and EPA—members of the task force—in November 1998. According to the study, it was impossible to guarantee that organisms in ballast water would not be transported by winds or currents toward suitable shoreside habitats when discharged within 200 nautical miles of shore.[23] The study also noted that suitable discharge areas varied depending upon winds and currents at a particular time. However, in looking at conditions around the United States, the study identified many locations where it appeared that ballast water exchange could safely occur less than 200 nautical miles from shore.

Ultimately, the Task Force did not recommend alternate discharge areas and the Coast Guard has not authorized ballast water exchange in any such areas under its regulations. In its 2004 final rule for the mandatory national ballast management program, the Coast Guard stated that it was examining the possibility of establishing alternate ballast water exchange zones and that information obtained at an October 2003 workshop, and future workshops, could provide a sound, scientific basis for establishing ballast water exchange zones within the EEZ. In 2004, the Massachusetts Institute of Technology published the proceedings from the October 2003 workshop.[24] The workshop

---

[21] *Regulatory Evaluation: Mandatory Ballast Water Management Program for U.S. Waters, Notice of Proposed Rulemaking USCG-2003-14273*, prepared by Standards Evaluation and Analysis Division, U.S. Coast Guard, Washington, DC, July 15, 2003; Programmatic Environmental Assessment for Ballast Water Management Program for U.S. Waters, prepared for Commandant, United States Coast Guard, Washington, DC, submitted by Battelle, Duxbury, MA, February 2004.

[22] In addition, under NISA, ships are allowed to claim a safety exemption from conducting an exchange and these ships, other than those entering the Great Lakes after operating beyond the EEZ, are not prevented from subsequently discharging ballast water in U.S. waters.

[23] *Ballast Exchange Study: Consideration of Back-up Exchange Zones and Environmental Effects of Ballast Exchange and Ballast Release*, Alfred M. Beeton, James T. Carlton, Bridget A. Holohan, Glen H. Wheless, Arnoldo Valle-Levinson, Lisa A. Drake, Gregory Ruiz, Linda McCann, William Walton, Annette Frese, Paul Fofonoff, Scott Godwin, Jason Toft, Lisa Hartman, and Elizabeth von Holle, a project of the Cooperative Institute for Limnology and Ecosystems Research, Ann Arbor, Michigan, a report to the National Sea Grant Program, National Oceanic and Atmospheric Administration and the Environmental Protection Agency, November 1998.

[24] The area of focus was from Cape Hatteras in North Carolina through the northern ports of the Canadian Maritime Provinces.

attendees—which included stakeholders from the marine industry, scientific community, policy makers, regulators, and nongovernmental organizations—developed a consensus statement regarding proposed alternate exchange zones along the northeastern coastline of the United States and Canada. The group proposed that alternate ballast water exchange areas, where there is consensus, be adopted as a working policy statement by both the United States and Canada for coastal vessel traffic until other treatment methods are available. In their statement, the attendees focused more on the depth of waters than on the distance from shore, noting that the continental shelf marks a location that helps determine whether organisms are likely to float toward shore or away from shore.

However, the Coast Guard reports that it has no plans to consider the use of alternate discharge zones. The ballast water program manager told us that designating alternate zones would take a significant amount of environmental analysis and a lengthy rulemaking process. She also said that alternate discharge zones will not be needed once other treatment technologies are installed on ships.

While the United States has not identified alternate locations for conducting ballast water exchange, the IMO and other countries have proposed allowing, or already allow, ballast exchange to occur in locations closer than 200 nautical miles from shore. The IMO convention, should it take effect as adopted, states that all ships conducting ballast water exchange should, whenever possible, do so at least 200 nautical miles from the nearest land and in water at least 200 meters deep. However, the convention recognizes that exchange at that distance may not be possible; if not, exchange should be conducted as far from the nearest land as possible, and in all cases at least 50 nautical miles from the nearest land and in water at least 200 meters deep. Australia requires that exchange be done outside 12 nautical miles in water exceeding 200 meters in depth.

The Canadian government proposed regulations in June 2005 that would allow transoceanic ships, unable to exchange ballast water more than 200 nautical miles from shore where the water is at least 2,000 meters deep because it would compromise the stability of the ship or the safety of the ship or of persons on board, to make the exchange in one of five alternate discharge zones that Canada's Department of Fisheries and Oceans determined could receive ballast water with little risk. For non-transoceanic ships that do not travel at least 200 nautical miles from shore and in waters at least 2,000 meters deep (for example, ships arriving from U.S. ports that travel near the coast), the proposed regulations would require ships to exchange ballast water at least 50 nautical miles from shore where the water is at least 500 meters deep. If that were not practical or possible, the ships would be allowed to use an alternate discharge zone. The minimum allowable depth in the alternative areas would be from 300 to 1,000 meters.

Concerns Persist Over the Effectiveness of Ballast Water Exchange

In 2002, we reported on numerous concerns about the effectiveness of ballast water exchange in removing potentially harmful organisms. There are two presumptions behind ballast water exchange as a method for ballast water treatment. First, it is presumed that the exchange will physically remove the water and organisms from ballast

tanks. Second, ballast water exchange presumes that there are significant differences in the salinity of the original ballast water, mid-ocean water, and the ecosystem into which the water is ultimately discharged, such as the Great Lakes. If the original ballast water were fresh, organisms in that water would, in theory, not survive in the salt water taken on in mid-ocean. Similarly, any mid-ocean organisms taken on during the exchange would not survive in the fresh water of a destination port. Evidence has shown, however, that these presumptions are not always borne out. For one thing, ballast pumps are not always able to remove all of the original water, sediment, and associated organisms. In addition, elevated levels of salinity do not necessarily kill all forms of potentially invasive organisms. Therefore, scientists believe that viable organisms can survive ballast water exchange and possibly become invasive when discharged to a new environment. The National Research Council highlighted the need for alternatives to ballast water exchange by stating in its 1996 report on ballast water management, "while changing ballast may be an acceptable and effective control method under certain circumstances, it is neither universally applicable nor totally effective, and alternative strategies are needed."[25] We noted in our 2002 report that despite the high compliance rate with mandatory ballast water exchange in the Great Lakes, invasive organisms, such as the fish-hook water flea discovered in 1998, were still entering the ecosystem.

Technologies Are Being Developed to Treat Ballast Water, but Challenges Remain Before They Can Be Used

Developers are pursuing technologies for use in treating ballast water, some of which show promise that a technical solution can be used to provide more reliable removal of potentially invasive species. However, the development of such technologies and their eventual use to meet regulatory requirements face many challenges, including the daunting technological challenges posed by the need for shipboard treatment systems and the lack of a discharge standard that would provide a target for developers to aim for in terms of treatment efficiency.

Some Promising Ballast Water Treatment Technologies Exist

Researchers and technology companies have been investigating the potential capabilities of many different ballast water treatment options, such as subjecting the water to filtration, cyclonic separation, ultraviolet radiation, chlorine, heat, ozone, or some combination of these methods. NOAA's Ballast Water Technology Demonstration Program has assisted in this regard by providing over $12 million in grants to 54 research projects since 1998. Related to this issue, the International Maritime Organization convention on ballast water required an assessment of the state of treatment technology to determine whether appropriate technologies are available to achieve the standard proposed in the convention. Toward this end, the United States and five other member countries submitted assessments of the state of treatment technology development. The United States' assessment was based on a study conducted by the Department of Transportation's Volpe National Transportation Systems Center. The center assessed

[25] *Stemming the Tide: Controlling Introductions of Nonindigenous Species by Ships' Ballast Water*, (Washington, D.C.: National Academy Press, 1996), 2.

about a dozen potential ballast water technologies and identified four basic approaches that it believed are sufficiently well developed to indicate that effective and practicable systems will be available to treat ballast water to some measurable performance standard. These technologies are (1) heat, (2) chlorine dioxide, (3) separation followed by ultraviolet radiation, and (4) separation followed by advanced oxidation treatment.

On the basis of this assessment, the United States took the position that developers of treatment technologies have made enough progress to suggest that the first proposed deadline in the convention could be met; namely, that ships built on or after 2009 and with a ballast water capacity of under 5,000 cubic meters could have treatment systems that could meet the discharge standards. However, the United States also stated that it was too early to tell whether treatment systems would be available for other categories of ships that will need them at a later date. After reviewing and discussing the evidence on the status of technology development provided by the United States and other member countries, the IMO's Marine Environment Protection Committee's technology review group recommended that there was no need to consider amending the schedule for implementing the convention due to a lack of progress on technology, although it recommended that the committee reexamine the status of technology in October 2006.

Development and Use of Ballast Water Treatment Technologies Face Many Challenges

Several challenges hamper development and use of ballast water treatment technologies. First, development of such technologies is a daunting task given the many operational constraints under which the technologies must operate. Beyond this hurdle, there is no discharge standard for how clean ballast water must be to help developers determine how effective their technologies need to be. Related to this, there is also no process for testing and approving technologies to determine how effective they are in removing potentially harmful organisms from ballast water. Coast Guard and other agencies have some actions underway on these issues, but they have not committed to firm schedules for completion.

Difficult Treatment Environment

The challenges of developing technologies to "treat" or remove potentially invasive species from ballast water are numerous. On the one hand, treating ballast water is not unlike treating household and industrial wastewater—now a rather routine treatment process. Like wastewater treatment facilities, ballast water treatment technology will need to be safe for the environment and crew, and achieve a specific level of pollutant removal (in the case of ballast water—removal of potentially invasive species). On the other hand, shipboard ballast water treatment systems will have to meet additional challenges that land-based wastewater treatment facilities do not, such as: (1) treating large volumes of water at very high flow rates and (2) removing or killing a much broader range of biological organisms—including unknown organisms. Importantly, the treatment systems must be able to operate in a manner that does not compromise ship safety. In addition, to make any treatment option palatable to the shipping industry, the systems must not displace an unacceptable amount of valuable cargo space. Consequently, the technologies must be dramatically smaller in scale than those

currently used in the wastewater industry while still achieving a high level of removal or "kill" rates. Further complicating matters, because ships differ in their structural designs, it is unlikely that one type of treatment technology will be appropriate for all types of ships. And, depending on how regulations are written, ships may need to be retrofitted to incorporate treatment technology—a potentially complex and expensive proposition.

No Discharge Standard for How "Clean" Ballast Water Must Be

When we reported in 2002, a key part of the Coast Guard's effort to move forward on dealing more effectively with the ballast water problem was its work to develop a discharge standard for ballast water—that is, a standard for determining how "clean" ballast water should be before it could be discharged into U.S. waters.[26] According to many stakeholders we have spoken with, one reason for the apparent slow progress on developing treatment technology is the lack of a discharge standard. Identifying a standard is necessary to provide a target for companies that develop treatment technologies. The lack of a discharge standard makes it uncertain what level of "cleanliness" treatment technologies will have to achieve. Companies may be hesitant to pursue research and development of a potential treatment technology not knowing what the standard may ultimately be—they stand to lose significant amounts of money if a standard turns in an unanticipated direction that they are unable to accommodate with their technology. In addition, until the shipping industry is required to meet some discharge standard, there is no incentive for ship owners to purchase ballast water treatment technology.

In 2002, the Secretary of Transportation reported to Congress that he expected to have a final rule on a ballast water management standard in the fall of 2004. The Coast Guard has been working with the EPA and other agencies to prepare a proposed regulation that will contain a discharge standard as well as an assessment of the environmental impacts of five possible discharge standards. The five alternatives being analyzed are: (1) taking "no action," which would mean continuing with ballast water exchange, (2) requiring that ballast water be sterilized before discharge, (3) matching the proposed IMO discharge standard, (4) allowing one-tenth the number of organisms allowed by the proposed IMO standard, and (5) allowing one-hundredth the number of organisms in the proposed IMO standard. In December 2004, the Coast Guard announced that it expected to propose a discharge standard by December 2005, however, the agency has since retracted that plan and was not able to give us a new date.

No Process for Approving Treatment Technologies

Complicating the development of technology is the lack of a process to approve ballast water treatment systems for use on ships. In August 2004, the Coast Guard published a Federal Register notice requesting comments by December 3, 2004, on how to establish a

[26] The United States District Court for the Northern District of California has held that EPA exceeded its authority under the Clean Water Act by excluding discharges incidental to the normal operation of a vessel from Clean Water Act permit requirements. See *Northwest Environmental Advocates v. EPA*, 2005 WL 756614. Court proceedings are still ongoing as to the appropriate remedies.

program to approve alternative ballast water management methods.[27] The agency stated in the notice its intention to promulgate the new program in the near future, but it has yet to do so. In the meantime, the Coast Guard, EPA, and the Navy have collaborated on preparing laboratory facilities in Key West, Florida that will be used to verify the performance of ballast water treatment technologies. According to the Coast Guard, the agencies will begin to test the new facilities in a few weeks. On a parallel track, NOAA's Ballast Water Technology Demonstration Program hopes to help address this gap as well by establishing a Research, Development, Test and Evaluation facility. This facility would be directed to establish standardization and quality control in experiments on ballast water technology. Current plans are to devote nearly $1 million to this facility over a 4-year period beginning in fiscal year 2006; depending on funding availability, operation of the facility could be continued. In addition, EPA's Environmental Technology Verification program is working to develop testing protocols in order to verify treatment technologies for eventual approval.

New Incentive Program

In 2004, the Coast Guard implemented a new program intended to encourage ship owners to test potential treatment technologies on their ships. With the Shipboard Technology Evaluation Program (STEP), the agency hopes to encourage ship owners to install experimental treatment technologies by agreeing that vessels accepted into the program may be granted an exemption from future ballast water discharge standards for up to the life of the vessel of the system. Notably, the program approves the use of a system on a single ship; it does not approve the use of that system for other ships. To be accepted into the program, the experimental technology needs to be capable of removing or killing at least 98 percent of organisms larger than 50 microns. To date, only two ship owners have applied to this program, but the Coast Guard has not yet accepted their applications. The Coast Guard has recognized that the application process is complex and plans to clarify it in hope of attracting more applicants.

Representatives of technology developers, shipping interests, and other stakeholders have offered several reasons for the low participation in the program. According to the stakeholders we spoke with, the primary reason is the lack of a defined discharge standard, rather than any particular aspect of the STEP program itself. The lack of a discharge standard, as well as the fact that use of ballast water treatment technology is not currently required, has made it difficult for technology developers to gather the venture capital needed to proceed aggressively on technology development since use of such technology is not required. Consequently, few technologies are ready to be installed and tested on board ships. One representative of a technology firm believes the Coast Guard should expand the size of the STEP program to provide more incentive to shipping companies and technology developers that want to test variations of technologies or test their technology on different types of ships. Currently, the agency is limiting the number of applicants to about 5 or 6 per year and expects each application to cover just one ship. Another stakeholder echoed this point, saying that the program requires ship owners to go to great lengths for the benefit of getting one ship approved.

[27] 69 *Fed. Reg.* 47,453 (Aug. 5, 2004).

One representative of a shipping association speculated that, although the STEP program is open to foreign companies, another possible reason for low participation is that foreign ships may spend little time in the United States.

Lack of Resources

Stakeholders to the technology development issue told us that technology development has also been hampered by a lack of resources. I have already noted that without a discharge standard or requirements for use of treatment technologies, it is difficult for companies to expend significant resources on development. In addition, as technology development progresses, the scale of testing required will increase and move beyond what can be done in a laboratory. At this point, developers will need to conduct "operational" testing on-board ships. However, estimates for shipboard studies exceed $1 million. Given the disincentives to pursuing technology development in this time of uncertainty, technology development will likely remain a problem.

States Are Moving Forward With Programs Because of Frustration with Lack of Federal Progress

As we reported in 2002, some states have expressed frustration with the federal government's progress on establishing a more protective federal program for managing the risks associated with ballast water discharges. Since then, several coastal and Great Lakes states have enacted legislation that is more stringent than current federal regulations. As you know, in June 2005, the governor of Michigan signed a bill into law that will require all oceangoing vessels to obtain a state permit before discharging ballast water into state waters. The state will issue the permit only if the applicant can demonstrate that the vessel will not discharge aquatic nuisance species or, if it will, that the operator of the vessel will use environmentally sound technology and methods as determined by the state department that can be used to prevent the discharge of aquatic invasive species. This requirement takes effect January 1, 2007.

Similarly, owing to concerns with possible species introductions via currently unregulated coastal shipping, California, Oregon, and Washington have enacted laws to regulate coastal traffic. The states' laws provide for additional measures that ships must currently take or will have to take in the future before entering state waters. All three states provide for safety exemptions.

- California. California law required the State Lands Commission to adopt new regulations governing ballast water management practices for ships of 300 gross tons or more arriving at a California port or place from outside of the Pacific Coast Region by January 1, 2005. The California State Lands Commission has proposed, but not yet finalized, these regulations. Upon implementation of the regulations, California law will require the ships to employ at least one of the following ballast water management practices: (1) exchange its ballast water more than 200 miles from land and at least 2,000 meters deep before entering the state's coastal waters; (2) retain its ballast water; (3) discharge water at the same location where the ballast water originated; (4) use an alternative,

environmentally sound method; (5) discharge the ballast water to a reception facility approved by the commission; or (6) under extraordinary circumstances, exchange ballast water within an area agreed upon by the commission and the Coast Guard. The proposed California regulation would require ships carrying ballast water from within the Pacific Coast Region to conduct any ballast water exchange in waters that are more than 50 miles from land and at least 200 meters deep.

- Oregon. Oregon law prohibits certain ships from discharging ballast water in Oregon waters unless the ship has conducted a ballast water exchange more than 200 miles from any shore, or at least 50 miles from land and at a depth of at least 200 meters if its ballast water was taken onboard at a North American coastal port. Oregon exempts ships that: (1) discharge ballast water only at the location where the ballast water originated; (2) retain their ballast water; (3) traverse only internal state waters; (4) traverse only the territorial sea of the U.S. and do not enter or depart an Oregon port or navigate state waters; (5) discharge ballast water that has been treated to remove organisms in a manner that is approved by the Coast Guard; or (6) discharge ballast water that originated solely from waters located between 40 degrees latitude north and 50 degrees latitude north on the west coast.[28]

- Washington. Washington's ballast water law applies to self-propelled ships in commerce of 300 gross tons or more and prohibits discharging ballast water into state waters unless a ship has conducted an exchange of ballast water 50 miles or more offshore, or further offshore if required by the Coast Guard. Some ships are exempt from this requirement, including ships that retain their ballast water or that discharge ballast water or sediments only at the location where ballast water was taken on. The coordinator of Washington's aquatic nuisance species program told us that during the legislative process, shipping industry representatives and oceanographic experts concurred that the 50-mile boundary for exchange was both feasible for the ships and protective against invasive species. After July 1, 2007, discharge of ballast water in state waters will be authorized only if there has been an exchange at least 50 miles offshore or if the vessel has treated its ballast water to meet standards set by the Washington Department of Fish and Wildlife.

Madam Chairman, this concludes my prepared statement. I would be happy to respond to any questions you or other Members of the Subcommittee may have.

(360567)

[28] The southern border of Oregon is at latitude 42 degrees north, while the northern border is at 46 degrees north.

Mrs. MILLER. Our next witness is Commander Kathleen Moore. On June 1, 2003, Commander Moore was appointed Chief of the Environmental Standards Division for the U.S. Coast Guard, which develops policy and regulations concerning marine environmental protection, both in the United States and as well as abroad. She also serves as a Program Manager for the Coast Guard's Aquatic Nuisance Species Program.

She obtained a Bachelor of Science degree in Mechanical Engineering and a Master's of Science degree in Engineering Management from the University of Maryland, as well as a Masters in Maritime—or, Marine Affairs from the University of Rhode Island. She left the aerospace industry to join the Coast Guard in 1990, and has since then completed staff tours at the Marine Safety Center and field tours in California and Puerto Rico.

We certainly look forward to your testimony at this time, Commander.

STATEMENT OF COMMANDER KATHLEEN MOORE, CHIEF, ENVIRONMENTAL STANDARDS DIVISION, U.S. COAST GUARD

Commander MOORE. Good afternoon, Madam Chairman, distinguished members of the subcommittee.

I am Kathy Moore, Chief of the Environmental Standards Division at Coast Guard Headquarters, and a manager of the Coast Guard's Aquatic Nuisance Species Ballast Water Management Program. It is my pleasure to appear before you today to provide the Coast Guard's views on ballast water management.

And I would like to also begin by saying thank you very much for your very kind words. There are over 4,000 Coast Guard personnel, both in and out of uniform, that are working very diligently with great determination and endurance responding to the tragedy in the gulf.

The administration shares this committee's concerns 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.

The Coast Guard is a leader in protecting America's waterways and maritime environment, and we take great pride in providing valuable services that preserve and protect our Nation's waters, making them cleaner, safer, and more secure. 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 invasive species.

We recognize the practice of ballast water exchange is not the ideal prevention method to remove the risk of ANS introductions into ballast water. And in early 2001, through a series of domestic and international workshops, concluded that a ballast water discharge standard should address all organisms at all life stages, that it be concentration-based, it needs to be set at values that are scientifically sound, environmentally protective, and enforceable. These criteria formed our approach in international negotiations at the International Maritime Organization, as well as our rulemaking, to develop a ballast water discharge standard.

We are currently completing an Environmental Impact Statement that analyzes the environmental impact of several alternative water discharge standards, as well as the cost-benefit analysis for implementing the rulemaking.

In February 2004, it's already been said the Coast Guard lead an interagency U.S. delegation to the IMO diplomatic conference on Ballast Water Management for Ships. The conference adopted the International Convention for the Control and Management of Ship's Ballast Water and Sediments, which is a significant step forward in the international effort to combat aquatic invasive species introduced through ships' ballast water. The U.S. delegation played a major role in developing the convention's basic structure and insuring 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 both to the shipping industry and emerging ballast water treatment industry of the need for investment, plans, and ballast water treatment equipment inventory to meet the ballast water management requirements.

Another key feature of the implementation schedule, is the phasing out of the ballast water exchange, which means most ballast water discharges will eventually have to meet a maximum concentration discharge standard. The standard adopted by IMO, as I said, is concentration-based, which was desired by the United States because the concentration approach provides for a more effective monitoring of compliance and a more uniform approach to the performance and protective level of reduction/risk across all vessels. The standard was adopted and, when met by all vessels, will likely reduce the discharges of potentially aquatic invasive species via ballast water, compared to the ballast practices of mid-ocean ballast water exchange.

An issue of relevance specifically to our Great Lakes, is the need for management strategies for the vessels that enter the Great Lakes with no ballast on board, referred to as NOBOB vessels. In 1993, ballast water management regulations were promulgated for entry into the Great Lakes addressing ballast water discharge by its vessels with full ballast tanks. These regulations remain the most stringent in the world for restricting the discharge of unmanaged ballast water. However, many vessels enter the Great Lakes system fully loaded with cargo, having discharged their ballast water to carry cargo. Only unpumpable residual water and sediment remain in these ballast tanks, and their residuals provide the opportunity for reduction—introduction of aquatic invasive species as their vessels conduct cargo operations, and take on and discharge ballast water in our Great Lakes.

This issue was the main focus of the NOBOB project performed by NOAA's Great Lakes Environmental Research Lab and its research partners. The project was begun in 2000, with funding by the Coast Guard, NOAA, and EPA. And the project results suggested the discharges of residual waters that are fresh or brackish, that is low salinity, have the highest risk of introducing aquatic invasive species into our Great Lakes.

The Coast Guard has considered short-term and long-term strategies to address this risk, and in August 2005 announced its new policy implementing best management practices. The policy encourages vessels that may eventually enter our Great Lakes to conduct mid-ocean ballast water exchange, exchanging ballast on voyages whenever possible. And if such ballast water exchange is not possible, to flush those empty tanks with the ocean ballast water to reduce the concentration of organisms through discharge and salinity shock. The consistent application of these practices should result in the elimination of residual water in the ballast tanks, and significantly reduce the risk of these residuals providing the opportunity for aquatic invasive species introductions.

The Coast Guard will be sampling vessels entering the Great Lakes to test the salinity of these residuals and to assess the application rate of these practices. In addition, there is work currently underway to assess the effectiveness of increasing salinity on fresh water organisms commonly found in ballast tank residual water.

Thank you for the opportunity to provide these comments on the Coast Guard's Ballast Water Management Program. The Coast Guard looks forward to working with Congress. It will continue our ongoing efforts to implement an effective ballast management water regime. And I'll be happy to answer any questions you may have.

Mrs. MILLER. Thank you, Commander. We appreciate your comments.

[The prepared statement of Commander Moore follows:]

U. S. Department of Homeland Security

United States Coast Guard

Commandant
United States Coast Guard

2100 Second Street, S.W.
Washington, DC 20593-0001
Staff Symbol: G-ICA
Phone: (202) 366-4280
FAX: (202) 366-7124

DEPARTMENT OF HOMELAND SECURITY

UNITED STATES COAST GUARD

STATEMENT OF CDR KATHLEEN MOORE

ON

BALLAST WATER MANAGEMENT

BEFORE THE

SUBCOMMITTEE ON REGULATORY AFFAIRS

COMMITTEE ON GOVERNMENT REFORM

U.S. HOUSE OF REPRESENTATIVES

SEPTEMBER 9, 2005

Good Afternoon, Madam Chairwoman and distinguished Members of the Subcommittee. I am CDR Kathleen Moore, Chief of the Environmental Standards Division at Coast Guard Headquarters, and manager of the Coast Guard's Aquatic Nuisance Species/Ballast Water Management Program. It is my pleasure to appear before you today to provide the Coast Guard's views on ballast water management.

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 United States has been a leader in international efforts to address this issue. 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 greater level of protection. We are committed to working with Congress to enact effective legislation that will address ballast water and substantially reduce the potential for damaging invasions through this pathway.

The Coast Guard is a leader in protecting America's maritime environment. We take great pride in providing valuable services that preserve and protect our nation's waters, making them cleaner, safer and more secure. 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 invasive species.

In early 2001, through a series of domestic and international workshops, the Coast Guard began working with scientists, marine engineers, experts from the water treatment industry and our Federal agency partners to develop criteria for a ballast water discharge standard. These workshops concluded that the standard should address all organisms at all life stages, be concentration-based and set at values that are scientifically sound, be environmentally protective and be enforceable. These criteria informed our approach for international negotiations at the International Maritime Organization (IMO), as well as our ongoing rulemaking, to develop a ballast water discharge standard. The ballast water discharge standard will be used to approve ballast water management systems installed on ships as an alternative to ballast water exchange, under our current legislative authority. The standard will also be used to evaluate compliance on ships that treat their ballast water. We are currently completing a Programmatic Environmental Impact Statement that analyzes the environmental impacts of several alternative ballast water discharge standards, as well as the cost-benefit analysis for implementing this rulemaking. These required analyses are important steps in the rulemaking process.

In February 2004, the Coast Guard led the interagency United States delegation to the 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, which is a significant step forward in the international effort to combat aquatic invasive species introduced by ships' ballast water. The U.S. delegation played a major role in developing the Convention's basic structure and 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 both the shipping industry and the emerging ballast water treatment industry of the need for investment, plans and ballast water treatment equipment 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 discharge standard. To facilitate the development of effective and practicable technologies, the Convention contains provisions for the experimental testing of prototype

ballast water treatment systems on operating vessels. This provision largely follows the Coast Guard's shipboard technology evaluation program, implemented in January 2004. 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.

The standard adopted by IMO is concentration-based rather than expressed as a percent removal. This was desired by the United States because the concentration approach provides for more effective monitoring of compliance and a more uniform and protective level of risk reduction across all vessels. The standard, as adopted and when met by all vessels, will likely reduce the discharges of potentially aquatic invasive species via ballast water, compared to the current practice of mid-ocean ballast water exchange. 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 five of which were adopted by IMO resolution in July 2005.

An issue of relevance specifically to the Great Lakes is the need for management strategies for the vessels that enter the Great Lakes with No Ballast on Board (NBOB), referred to as NOBOB vessels. In 1993, when the ballast water management regulations were promulgated for entry into the Great Lakes, the focus was on addressing the volume of ballast water being discharged by vessels with full ballast tanks. These regulations remain the most stringent in the world for restricting the discharge of unmanaged ballast water. However, many vessels enter the Great Lakes system fully loaded with cargo, having discharged their ballast water to carry as much cargo as permissible. Only unpumpable residual water and sediments remain in their ballast tanks and these residuals provide an opportunity for introductions of aquatic invasive species into the Great Lakes as these vessels conduct cargo operations, and take on and discharge ballast into the Great Lakes. This issue was the focus of the NOBOB project performed by the National Oceanic and Atmospheric Administration's Great Lakes Environmental Research Laboratory and its research partners. This project was begun in 2000 with funding from the Coast Guard, National Oceanic and Atmospheric Administration and the Environmental Protection Agency in an effort to better understand the risk of introduction of aquatic invasive species via NOBOBs and the physical/chemical characteristics of residual water and sediment. The results of the project suggested that discharges of residual waters that are fresh or brackish (low salinity) have the highest risk of potentially introducing aquatic invasive species into the Great Lakes. The Coast Guard has considered short-term and long-term strategies to address this risk and, in August 2005, announced a new policy implementing best management practices. This policy encourages vessels that may eventually enter the Great Lakes to conduct mid-ocean ballast water exchange on ballast voyages whenever possible and, when such ballast water exchange is not possible, to flush empty ballast tanks with mid-ocean water to reduce the concentration of organisms through dilution and salinity shock. The consistent application of these practices should result in the elimination of fresh and brackish residual water in ballast tanks and significantly reduce the risk of these residuals providing the opportunity for aquatic invasive species introductions. The Coast Guard will be sampling vessels entering the Great Lakes to test the salinity of these residuals and to assess the application rate of these practices. In addition, there is work currently underway to assess the effectiveness of increasing salinity on the freshwater organisms commonly found in ballast tank residual water.

Thank you for the opportunity to provide comments on the Coast Guard's Ballast Water Management Program. 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.

Mrs. MILLER. And our final witness to make an opening remark, is Doctor Stephen Brandt. Doctor Brandt serves as the director of the Great Lakes Environmental Research Laboratory, which is the National Oceanic and Atmospheric Administration's leading institution for aquatic invasive species research. He received a Ph.D in oceanography and limnology, with a Ph.D minor in statistical analyses and experimental design from the University of Wisconsin.

He's been involved in research on the biology of the Great Lakes region for almost 30 years, and has created the NOAA National Center for Invasive Species Research. He's also been the chief scientist on over 80 research cruises, spent over 700 days at sea, published over 70 papers, and given over 200 scientific presentations.

So we certainly welcome you, Doctor, and look forward to your testimony, sir.

STATEMENT OF STEPHEN BRANDT, DIRECTOR, NOAA GREAT LAKES ENVIRONMENTAL RESEARCH LABORATORY

Mr. BRANDT. Thank you. Good afternoon, Chairman Miller, and members of the subcommittee.

I appreciate the opportunity to talk about NOAA's research on the invasive species in the Great Lakes, particularly regarding no ballast on board or NOBOB vessels, ballast water treatment technology, and Federal coordination.

About 180 nonindigenous species are already established in the Great Lakes. This is a serious issue. As the gateway to America's heartland, the Great Lakes also provide a pathway for invasive species to spread throughout the United States, as zebra mussels have done since their first appearance in the nearby Lake St. Clair. This invasion led directly to the passage of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990.

NOAA's primary role in the development of ballast water management regulations, is to provide the research and scientific information to make sound policies and to develop preventive measures and treatments that are effective.

The Great Lakes Environmental Research Laboratory [GLERL], is NOAA's leading institution for aquatic invasive research. It also houses the NOAA national center for research on invasive species, to insure that NOAA's research is coordinated across regions where it has a broad range of disciplines and strong partnerships with over 150 institutions which insures that NOAA meets its legislative mandate to conduct invasive species research, all of which falls within the priority set by the ANS task force and the National Management Plan.

As heard, commercial vessel ballast tanks are, by far, the most significant means for moving aquatic species around the globe. Ballast water exchange is the only approved management method. However, only a few studies on a few organisms on a few vessels have examined the effectiveness of open ocean ballast exchange. And results vary widely from 35 to 95 percent effectiveness. The lack of detailed assessments of this process, is a fundamental gap in comparing the value of ballast water exchange to alternative strategies.

The overall ballast water issue is complicated by the architecture of the ballast tank, which differs from vessel to vessel. Tanks are

often honeycombed and not designed for easy access for thorough flushing. Reliable and appropriate treatment of ballast water is still in development.

In 1996, Congress set up the ballast water management demonstration program to develop new management technologies. This competitive grants program was administered by the U.S. Fish and Wildlife Service and NOAA, with the Maritime Administration providing testing platforms. To date we have sponsored 54 projects on 8 of the 9 technologies that the National Research Council listed as having potential application. Among these are filtration, thermos treatment, bioscience and others. Additionally no sea grant program has sponsored 23 ballast-related projects. Although several technologies hold promise, none of them were fully tested at full-scale operational conditions.

Invasions have continued since ballast exchange began. Recent data show that 90 percent of the foreign vessels entering the Great Lakes are NOBOB, or declaring no ballast on board. However, some of the water and sediment remains in ballast tanks even after complete pump out. These vessels are not covered by ballast water exchange regulations. Water that is eventually taken on to main trim can mix with these residuals and be discharged later. The magnitude of such risks for invasion is not clear.

NOAA, through GLERL, is conducting the first ever research on NOBOBs, and just completed a large program to characterize the biota found in NOBOB vessels, to assess its sediment accumulation versus ballast management practices, and to evaluate the effectiveness of mid-ocean exchange.

In the 42 NOBOB vessels surveyed, water and sediment residuals contained in the first group of live biota, including dozens of noninvasive species not yet recorded in the Great Lakes. And some of those were in resting stages, which are extremely resistant to adverse conditions. Detailed reports are available in an extensive report published in May.

Other major conclusions were simply: NOBOB vessels are effective for nonindigenous species; lowering the risk of NOBOB-related invasive species can be accomplished with diligent application of good management practices, and perhaps salt water flushing and ballast water exchange itself isn't perfect.

In many ways, the recent progress we have seen, is the result of a virtually unprecedented degree of cooperation by a number of different Federal agencies, universities, and the private sector. This cooperation's been fostered by the interagency Aquatic Nuisance Species Task Force, chaired by NOAA and the Fish and Wildlife Service, in addition to the National Invasive Species Council, which also helps with coordinating actions and policy more broadly across 13 Federal departments and agencies.

Another recent example of coordination occurred when the 11 agency regional working group established by the President's Great Lakes Executive order developed a rapid response and coordinated a sampling program in response to the discovery of a snake head fish off Chicago, that within days confirmed that this was an isolated case. Indeed, the NOBOB investigation itself that we talked about, is another good example of collaboration between NOAA, the

Great Lakes Protection Fund, Coast Guard and EPA, universities, and very importantly, the shipping community.

In summary, we are optimistic that ongoing research and collaboration will lead to a number of promising technologies in the future. This concludes my testimony, and I'll be happy to respond to any questions that you might have.

Mrs. MILLER. Thank you.

[The prepared statement of Mr. Brandt follows:]

WRITTEN TESTIMONY OF
STEPHEN B. BRANDT, DIRECTOR
GREAT LAKES ENVIRONMENTAL RESEARCH LABORATORY
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

BEFORE THE
SUBCOMMITTEE ON REGULATORY AFFAIRS
COMMITTEE ON GOVERMENT REFORM
U.S. HOUSE OF REPRESENTATIVES

September 9, 2005

Good morning, Chairman Miller. I am Stephen Brandt, Director of the Great Lakes Environmental Research Laboratory (GLERL), a research component of the National Oceanic and Atmospheric Administration (NOAA) of the Department of Commerce. I appreciate the opportunity to speak to you about NOAA's current invasive species research priorities, GLERL's role in invasive species research, no ballast on board (NOBOB) vessels, the status of ballast water treatment technology, and Federal coordination and cooperation. I currently co-chair the Council of Great Lakes Research Managers of the International Joint Commission. In addition, I serve as NOAA's regional representative on the Great Lakes Interagency Collaboration Working Group.

Invasive Species and the Great Lakes

It is highly appropriate that this hearing is taking place in a city on the shores of Lake St. Clair. The poster child for aquatic invasions—the zebra mussel—was first discovered in Lake St. Clair in 1988. The introduction of zebra mussels provided the initial impetus for coordinated Federal action on aquatic nuisance species and led directly to the passage of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (NANPCA). Those of us in the Great Lakes region, however, are acutely aware of the fact that the invasive species problem is not a single species problem. Approximately 180 nonindigenous aquatic species have become established in the Great Lakes. Many of these species have only had minimal impacts on Great Lakes resources, but a few have profoundly changed Great Lakes ecosystems and been very costly. Probably only a few of us remember when lake trout were a major recreational and a significant commercial fishery before sea lampreys began to plague the upper Great Lakes. We are still living with the consequences of that introduction. The Great Lakes Fishery Commission estimates that sea lamprey control expenditures have totaled $250 million, and we continue to spend $12-15 million per year for control activities. More of us certainly remember when die-offs of introduced alewives fouled our beaches before an adaptive management program was introduced. Some of us have had direct experience with spiny and fishhook water fleas fouling our fishing gear. Most recently, the State of Ohio had to shut down its smallmouth bass fishery during the peak season for recreational anglers in

the western portion of Lake Erie because of predation on unguarded nests by the round goby.

The Great Lakes basin is the aquatic gateway to the heartland of America and a hot spot for aquatic species introductions to major interior sections of the United States. While the spread of aquatic species introduced in most U.S. coastal ecosystems is generally restricted to adjacent contiguous coastal ecosystems, the Great Lakes provide a pathway for freshwater-adapted invasive species to spread throughout the interior waters of the central and eastern United States. One need only examine the spread of zebra mussels to understand this - they are now found outside the Great Lakes-St. Lawrence River system as far west as eastern Arkansas, as far south as the Mississippi delta below New Orleans, Louisiana, and east as far as the Hudson River estuary north of New York City. Zebra mussels have fouled industrial and municipal water intakes, which must now be chemically treated on a regular basis throughout the summer months to keep them flowing. Estimates of the annual cost of zebra mussel control and mitigation are in the $100's of million per year in the Great Lakes basin alone.

Just as disturbing as the total numbers of introduced species is the fact that the number of introductions has not decreased significantly. Some believed that by requiring vessels arriving from outside the U.S. EEZ to exchange ballast water prior to entering the Great Lakes, this trend would be reversed. But we have seen introductions continue, and this has drawn attention to the issue of ships with no ballast on board (NOBOB). The majority of ships that enter the St. Lawrence Seaway technically are carrying no ballast, but may have residual water and sediment that can be resuspended and discharged in their passage through the Great Lakes. When we realized that NOBOB ships could be a source for new introductions, GLERL began a research program to investigate this pathway. Earlier this year, we released a final report, and I will discuss the results later in my testimony.

Research Priorities for Invasive Species

Research is critically needed to improve the scientific basis for our decision-making. I would like to focus on several current areas of research, including ballast water exchange, technology, vessels declaring 'no ballast on board' or NOBOB's, patterns of invasion, and impacts.

Ballast Water Exchange Research

Only a few studies have examined the effectiveness of open-ocean ballast water exchange, the only ballast water management practice currently approved by the United States. Existing studies have been restricted to a few vessel types and only assessed the effect of exchange for a few organisms. The lack of detailed assessments concerning the mechanics and effectiveness of ballast water exchange represents a fundamental gap in determining the value of exchange, compared with alternative strategies to prevent future invasions.

For the Great Lakes, the protective effects of exchange may be greater than for other coastal regions. The concentration of organisms in open-ocean water is much lower than in coastal areas where ships are likely to have taken on their original ballast water. For ships bound to marine U.S. coastal waters, the effect of ballast water exchange is primarily dilution, which results in a reduction in the concentration of organisms in the ballast water. For ships bound for the Great Lakes, the largest freshwater system in the world, exchange with open-ocean water plays two prevention/protection roles: (1) exchange reduces the number of organisms present in the ballast water through dilution and (2) exchange also kills many organisms from foreign fresh or low-salinity brackish coastal areas that are adapted to freshwater and thus salinity intolerant.

Technology Development Research

Ballast tanks are, by far, the most significant means by which aquatic species are being moved around the globe. Research and technology development are the keys to workable and effective methods to reduce invasive species introductions from ballast water and tanks. However, the problem is complex. The architecture of ballast tanks differs from vessel to vessel. Many ballast tanks are partitioned into relatively small compartments, like a honeycomb, with interconnecting holes for water movement. Most ballast tanks are not designed for easy access and most are crisscrossed with ribbing for structural support that can disrupt the flushing of material from the tank, or the mixing of a biocide throughout the tank. Some tanks have a low, flat profile, while others are cavernous.

Reliable and affordable technology for effective treatment of ballast water, either before it enters a ship or while in the ballast tanks, is still in development. Several alternative ballast water treatment technologies are in varying stages of testing. The two most common approaches being worked on include physical removal of organisms or treatment to kill them. In addition, methodologies for dealing with pathogens and parasites as well as affirmation that treatment technologies are effective against them are needed. An additional problem encountered is finding full-scale ballast tanks in which such testing can be performed.

NOBOB Research

Although circumstances vary from ship to ship, some water and entrained sediment usually remains in ballast tanks even after complete pump-out. The residual water and sediment can contain a wide assortment of plants, animals, and microorganisms, including so-called "resting stages" such as cysts or resting eggs. The life cycles of many invertebrates, algae (including toxic dinoflagellates), protozoan, and bacterial species include the capability of producing resting stages. Production of resting stages ensures long-term viability of the population because they are extremely resistant to adverse conditions including anoxia, noxious chemicals, freezing, and passage through digestive tracts of fish and waterfowl. Resting eggs of invertebrates and cysts of dinoflagellates usually sink when released. Resting stages may remain viable in sediments for decades or even centuries (Hairston et al. 1995), and can germinate or come to life under a combination of favorable light, temperature, and other environmental conditions.

We are particularly concerned about residual sediments in ballast tanks in the Great Lakes region, where 69-80% of the foreign vessels entering are declared NOBOB. Consider a tank holding 1500 metric tons of water when full. If only 0.5% of that volume is unpumpable, then up to 7.5 metric tons (7.5 cubic meters, or about 2,000 gallons) of water would remain. Across a ship's numerous tanks, a significant volume of ballast water and mud can remain on board. As ballast water treatment technologies are developed and tested, their effectiveness in dealing with the NOBOB residuals should also be evaluated.

The effects of different management practices on reducing the biological invasion risk associated with NOBOB tanks is a critical area for research. Use of best management practices may enhance the effectiveness of new treatments by reducing the amount of mud present during treatment. As part of this effort, research is needed to develop remote measurement capabilities that allow better measurements of the amount of sediment accumulated across the entire ballast tank.

Patterns, Corridors, and Vectors of Invasion

Preventing the movement of non-native organisms from one location to another is the only effective strategy to prevent invasions. A major barrier to planning for and preempting future invasions is trying to identify where future species invasions may originate and which species may pose the highest potential risk of successfully invading that ecosystem. Comprehensive analyses of recent and past patterns of species invasions by coastline, region, or coastal ecosystem may help to identify the most significant invasion corridors or pathways by which invasive species are brought to our coastal ecosystems. Monitoring and analysis of global trade patterns may be able to help identify future shifts in likely invasion corridors leading to the United States. These analyses may help determine which species are capable of invading U.S. coastal ecosystems.

Minimizing the Ecosystem and Economic Impacts of Invaders

Once a species has become established in an ecosystem, the ecosystem by definition has changed and the species is nearly impossible to eradicate. Unlike many chemical contaminants that dissipate through time, invasive species do not have a 'half-life' and are likely here to stay. While we can try to contain the species, it is a very difficult task to accomplish. Management needs to adapt to the presence of an invasive species, and the sooner that adaptation can be made, the greater the chance is to minimize the species impact.

Research is necessary to make this adaptation. Monitoring and long-term assessment, targeted to the regional level and integrated at the national level, are essential components of this type of research. Many of the present management approaches in the Great Lakes are based on studies and models that were developed before the major incursions of invasive species in the 1980s. The zebra mussel has had perhaps the most profound effect on the Great Lakes ecosystem, second only to human beings. Studies to modify existing ecosystem management models or develop new models that accurately account

for the food web and energy flow changes caused by invasive species are critically needed.

GLERL's Role and Activities in Aquatic Invasive Species Research

GLERL is headquartered in Ann Arbor, Michigan, and has been in existence for over 30 years. GLERL has been actively engaged in research on aquatic invasive species since shortly after zebra mussels were initially discovered in Lake St. Clair in 1988. Our mission is to conduct high-quality research and provide scientific leadership on important issues in both the Great Lakes and marine coastal environments, leading to new knowledge, tools, approaches, and awareness.

GLERL achieves its mission through applied research, monitoring, technology development, information synthesis and assessment, multi-institutional partnerships, scientific leadership and education. GLERL houses a unique combination of scientific expertise in biogeochemical, hydrological, ecological, physical limnology, fish ecology, and oceanographic sciences. This broad range of disciplines is needed to adequately understand and address the important and complex issues that confront the effective management of aquatic environments. GLERL's research is focused on developing high-level capabilities in ecosystem forecasting currently organized into four broad research themes: Ecological Prediction, Aquatic Invasive Species, Physical Environment Prediction, and Environmental Observing Systems. GLERL works to determine and forecast how ecosystems are changing, the nature and causes of those changes, and the impacts of those changes.

GLERL has a strong history and fundamental belief in collaboration and partnerships. GLERL has a formal Cooperative Institute with the University of Michigan (The Cooperative Institute for Limnology and Ecosystems Research) that provides a direct bridge between GLERL and academic institutions throughout the Great Lakes basin. Overall, GLERL's research is coordinated with a number of agencies, institutions, and the user community at a number of levels and in a number of ways. For example, research scientists collaborate routinely in order to take advantage of each other's expertise and avoid duplication of effort. Other coordinating efforts occur through policy committees, the International Joint Commission (IJC) Council of Great Lakes Research Managers, scientific meetings and workshops. GLERL houses the headquarters of the International Association for Great Lakes Research. Current active collaborations of GLERL scientists include 240 scientists representing approximately 150 institutions spread across 27 states, 5 provinces of Canada, and 14 foreign countries. These institutions include 19 federal agencies, 50 universities, and 25 other entities, which include U.S. and foreign private institutions and state and local institutions. GLERL scientists serve on a number of scientific and advisory committees such as the IJC Council of Great Lakes Research Managers, the technical Science Advisory Board of the Great Lakes Fishery Commission, and the Binational Climate Committee. A Sea Grant extension agent was placed at GLERL in 2002 with the responsibility to provide a two-way linkage with the Great Lakes coastal community via the existing network of nearly 70 Sea Grant extension agents in the region. The goal is to ensure that GLERL's research gets to those who

could use it and also to make sure that user needs are being met by GLERL's research. GLERL scientists thus play a critical role in academic, state, federal, and international partnerships, provide information to support decisions that affect the environment, recreation, public health and safety, and the economy of the Great Lakes and coastal marine environments.

GLERL is NOAA's leading institution for aquatic invasive species research and has a legislative mandate to conduct such research. All of GLERL's research on invasive species falls within the priorities set by the Aquatic Nuisance Species (ANS) Task Force and builds directly on the National Management Plan. GLERL represents NOAA on the Great Lakes Regional Panel of the ANS Task Force and has actively served on that panel since its inception. GLERL scientists have also served on various committees of the National Invasive Species Council to help develop the National Invasive Species Management Plan and work in direct collaboration with other agencies on these activities including the U.S. Coast Guard and Environmental Protection Agency. GLERL has also taken the lead to develop a 5-year strategic plan for invasive species research

The primary purpose of GLERL's invasive species research is to expand our knowledge of invasive pathways and the biology and ecological impacts of nonindigenous species in the Great Lakes. Research on pathways has focused on the ballast water vector and GLERL has NOAA's only in-house ballast-related field and laboratory programs. Our impact research involves field investigations on Lake Michigan, Saginaw Bay, Lake Huron, and other sites to measure ecosystem changes and community responses to invading species, and to examine the ecology of the organisms themselves. Research also includes laboratory experiments to examine the biology (feeding, development, physiology) and ecological interactions of the invading organisms, including study of how these organisms absorb, metabolize, and eliminate or accumulate toxins. The program historically focused on the zebra mussel, but has recently expanded to address impact of other aquatic invasive species.

The NOAA National Center for Research on Aquatic Invasive Species is based at GLERL, with regional coordinators in the Great Lakes and Florida to ensure that NOAA invasive species research is coordinated across regions. GLERL maintains a Great Lakes Aquatic Nonindigenous Species Database and uses network analysis to model and quantify the impact of exotic invertebrate invaders on food web structure and function.

Of particular relevance to ballast water management, GLERL is determining the effectiveness of biocide treatments, such as chemicals, heat, UV light and oxygen deprivation on the viability of resting eggs, often found in ballast water and NOBOB vessel sediments. GLERL is also working with several private companies and the U.S. Naval Surface Warfare Center to use computational modeling of ballast tanks to improve understanding and maximize effectiveness of management practices and treatment mechanisms.

No Ballast on Board (NOBOB)

As I mentioned earlier, NOAA, through GLERL, is conducting research on NOBOB and how to prevent species invasions from the residual water and sediments on board these vessels. Most recently, NOAA completed a three-year multi-institutional research program to characterize the biota found in NOBOB vessels entering the Great Lakes and to evaluate the effectiveness of at-sea ballast water exchange. The residual water and sediment remaining in these NOBOB vessels can contain a wide assortment of plants, animals, and microorganisms.

Between 69-80 percent of the saltwater ships entering the Great Lakes are NOBOB vessels and are not required to conduct exchange under the ballast water management regulations implemented in 1993 by the U.S. Coast Guard.

NOBOB ships are loaded to capacity with cargo and carry no pumpable ballast water on board. However, water taken on as ballast by a NOBOB vessel in a U.S. port to maintain trim and stability during operations between ports can mix with residual ballast water, sediment, and any associated invasive organisms, and later be discharged into U.S. waters as the vessel moves between a succession of ports. Thus, ballast-water operations of NOBOB vessels present a risk of invasion; the magnitude of such risk is unclear.

A multidisciplinary NOBOB Assessment Program was designed to conduct reseach to directly assess the potential invasion threat represented by overseas vessels operating in the Great Lakes. The primary objectives of the research were to characterize the biota in ballast tank residues, assess sediment accumulation vs. ballast management practices and evaluate efficacy of mid-ocean exchange in removing coastal organisms from low salinity ballast. All results are reported in an extensive report "Assessment of Transoceanic NOBOB vessels and Low-Salinity Ballast Water as vectors for Non-indigenous Species Introductions to the Great Lakes."

The research team surveyed 103 NOBOB vessel crews about their management practices and boarded 42 of those vessels to enter and sample residual water and sediment in 82 ballast tanks. Total ballast residuals (water and/or sediment) ranged from negligible to 200 metric tons with an average water residual of 44 tons and average sediment residual of 20 tons. The study also found that ships were making a considerable effort to minimize sediment, as approximately 60% of those samples were less than 10 tons of sediment. Moreover, the results indicated that ships' crew were generally aware of invasive species issues.

A diverse group of live phytoplankton (small, floating plant life) and invertebrate biota (eggs, larvae) were found in the residuals, including dozens of non-indigenous species not yet reported in the Great Lakes. While microbial pathogens were detected in about half the ballast tanks sampled, further assessment is needed to determine if these pathogens pose a human health risk. The study also found evidence that saltwater flushing may decrease the number and diversity of live organisms, but this observation requires further experimental verification. GLERL is working with the U.S. Coast Guard on a research plan to do so.

The NOBOB study concluded that ballast water exchange "can be highly effective for reducing the concentration of organisms entrained with coastal ballast water," but that "potential benefits to the Great Lakes attributed to 'salinity shock' should be regarded with caution," because of the wide range of salinity tolerances found in nature.

Other general conclusions were:

- The microbial, phytoplankton and invertebrate data and evaluations developed during this study confirm that NOBOB vessels are a vector for non-indigenous species introductions to the Great Lakes basin, potentially for algal and invertebrate biota.
- Risk of introduction via egg/spore hatching from sediment is very low compared to risk associated with organisms in residual water. Residual water comprises approximately 69% of ballast residuals and invertebrates and phytoplankton in residual water probably have the greatest opportunity for expulsion from ballast tanks.
- Invertebrates and phytoplankton were lower (particularly freshwater species) in ballast tanks that had been flushed or exchanged, resulting in saline residuals.
- All biota generally decline during transport in proportion to duration.
- Several non-indigenous species were detected in Great Lakes water loaded as ballast and could be spread to the upper Great Lakes.
- Ballast water exchange is imperfect, but is the only management practice now available in the absence of more effective and consistent management tools.
- The risk of NOBOB-related invasive species introductions can be lowered with diligent application of good management practices, but maximum protection will need new highly effective methods to treat ballast water and residuals to required biological end points.
- Estuarine species were found to have a variable tolerance to salinity shock and some are able to survive prolonged exposure to higher salinities.
- NOBOB vessels entering the Great Lakes with fresh or low-salinity residuals represent the greatest threat for aquatic invasive species introductions.
- There was no evidence that NOBOB residuals are a significant threat to human health, but it is prudent to consider all ships as potential carriers of pathogens.

GLERL is conducting research on NOBOB vessels and how to prevent species invasions from the residual water and sediments that they carry. This includes research on disinfection of ballast water and residual sediments with chemical disinfectants. The research found that a concentration of 500 parts per million (ppm) of glutaraldehyde is required to kill resistant organisms. The cost to treat the residual sediments in the tanks of a NOBOB vessel with this concentration of glutarahyde would be about $6000 per voyage (about 0.7% increase in freight rate per metric ton or about 0.3% of the gross revenue per voyage).

This is a complex problem, and the study provides a more comprehensive scientific basis for considering new policies and identifying possible preventive measures and

treatments. It will require the cooperation of regulatory agencies, the scientific community, the shipping industry, and the public to identify the best solutions.

Status of Ballast Water Treatment Technology

When NANPCA was passed in 1990, Congress recognized that there was a larger issue than the problems being caused by zebra mussels. Recognizing that the pathway that brought the zebra mussel to the United States could be a pathway for other species, the law required that steps be taken to manage ballast water. By the time that NANPCA was due for reauthorization, it was common knowledge that ballast water currently was and continues to be the most significant pathway for new introductions into coastal waters.

The passage of the National Invasive Species Act in 1996 expanded the ballast water provisions contained in NANPCA. The U.S. Coast Guard was charged with setting up voluntary guidelines for ballast water management and monitoring the effectiveness of the voluntary guidelines. After a finding that the voluntary guidelines were not effective, the U.S. Coast Guard issued regulations making ballast water management mandatory, with certain exceptions, for all commercial vessels entering U.S. ports from outside the Exclusive Economic Zone. These regulations became effective September 27, 2004.

When the NANPCA was passed in 1990, virtually the only option available for ballast water management was ballast water exchange. Because the mandatory provisions applied to the Great Lakes, it was assumed that the risk of new introductions would be substantially reduced. However, it became increasingly obvious that mid-ocean exchange was only an interim solution to the broader problem. First, exchange has associated safety issues. Second, research on the efficacy of ballast water exchange had a wide range of results. The range of organisms removed varied from 35 percent to over 95 percent. By the time of the reauthorization of NANPCA in 1996, there was widespread agreement that the ultimate solution would be in the development of treatment technologies. In 1996, the National Research Council of the National Academy of Sciences published a report containing an evaluation of potential treatment technologies.

During the reauthorization in 1996, the Congress set up a competitive grants program for the development of new ballast water management technologies, the Ballast Water Management Demonstration Program. The program was to be administered by the U.S. Fish and Wildlife Service (FWS) and NOAA, and priority was to be given to technologies identified as promising in the National Research Council report. Rather than setting up separate programs, NOAA and FWS issued a joint request for proposals and had a joint peer review panel to evaluate proposals. In addition to non-federal scientists and engineers, the peer review panel has had representation from the U.S. Coast Guard and the Environmental Protection Agency. The Maritime Administration of the Department of Transportation (MARAD) volunteered to provide testing platforms for new technologies and was added as a third partner. In addition to providing its own ships as testing platforms, MARAD, in cooperation with NOAA, will outfit a MARAD barge

to serve as a technology testing platform in the Great Lakes beginning in the spring of 2006.

Initially, most of the projects were smaller scale and involved proof of concept. We have progressed to larger scale testing of specific technologies. In some instances, the questions were as much engineering as basic science. For instance, although effective filtering systems are available, there is a question as to whether they can filter large volumes of water in a short period of time without clogging the filter. One of the projects involved development of an automatic backflush system to prevent clogging. To date, we have sponsored projects on eight of the nine technologies that the National Research Council listed as having even limited application. Research has been sponsored on a wide range of technologies including filtration, thermal treatment, ultra violet radiation, biocides, acoustic bombardment, ozone injection, and nitrogen injection. To date, NOAA and FWS have funded 54 projects through the Ballast Water Management Demonstration Program. In addition, NOAA's Sea Grant program has funded an additional 23 ballast related projects.

I am pleased to report that several technologies hold promise. However, none of the technologies has been fully tested at full-scale under operational conditions and is ready for commercial production. The focus of future research should be addressing this need. In this regard, the U.S. Coast Guard and the U.S. Environmental Protection Agency entered into a memorandum of understanding in June 2001 for the development of rigorous testing protocols under the Environmental Technology Verification (ETV) program for use when evaluating Ballast water treatment technologies at land-based test facilities. With finalization by the International Maritime Organization (IMO) of the text for an International Convention for the Control and Management of Ships' Ballast Water and Sediments and its ongoing work on the development of the implementing guidelines, in particular the Guidelines for the Approval of Prototype Ballast Water Treatment Technologies, we believe that the impetus for full-scale testing and commercial development will increase. The treatment that will emerge to prevent and manage invasive species introductions will likely not be a single technology. It may be that even on a single ship, there will be sequential treatment. As an example, a combination of technologies is being installed aboard the ship Federal Wellend in the Great Lakes this fall by Fednav International. In sequence, the system will involve filtration, nitrogen injection, and cavitation.

To demonstrate our optimism that technologies should be available in the near future, I would note that in a recent submission to the Marine Environment Protection Committee of the IMO, the United States expressed its judgment that treatment technologies would be available by the initial date for installment on new ships—January 1, 2009. Both Germany and Norway submitted similar judgments.

Federal Coordination and Cooperation

The efforts of the Federal government on ballast water issues have demonstrated how coordination can improve our effectiveness. Much of this activity has been fostered by

the interagency Aquatic Nuisance Species Task Force set up under NANPCA. The Task Force is chaired by NOAA and FWS and has seven other federal members and thirteen *ex officio* members representing other levels of government. In addition, two invited observers from Canada's Federal Government participate. This pattern is repeated with even stronger state government and other stakeholder involvement on each of the Task Force's six Regional Panels. In addition to his important role with Michigan's Department of Environmental Quality, Roger Eberhardt, who will be testifying later, is the Chair of the Task Force's Great Lakes Regional Panel.

Similar coordination is occurring at a regional level here in the Great Lakes. As an example, when a snakehead fish was discovered near Chicago, alarm bells went off. The Regional Working Group, representing 11 federal agencies, was established by Presidential Executive Order in May 2004. We developed a rapid response and coordinated sampling program that, within days, confirmed that this was an isolated case. Although it proved to be an isolated occurrence, it highlighted the need to have procedures in place for future incidents. A memorandum of agreement to cover rapid response activities in the Great Lakes is now in place. It involves eleven federal agencies and state governments.

The Aquatic Nuisance Species Task Force is not the only entity working on such coordination. Executive Order 13112 created a National Invasive Species Council (NISC) to help coordinate invasive species actions more broadly. NISC currently has representatives from thirteen federal departments and agencies. While the Aquatic Nuisance Species Task Force is involved with implementation of species activities, NISC is a policy and coordinating body. In order to give structure to the federal government's efforts in addressing invasive species issues, NISC prepared a comprehensive National Management Plan. On a regional level, invasive species are a key element in the Great Lakes Regional Collaboration. Similarly, a number of executive agencies are working together on the Security and Prosperity Partnership that was set up with Mexico and Canada. Invasive species were explicitly mentioned in the agreement, and ballast water has been identified as an area of cooperation.

Ballast water research is an excellent example to show how collaboration and cooperation work. From a NOAA perspective, it is not an exaggeration to state that we often are in contact with other federal agencies on ballast water issues several times a week. Regular meetings take place among the federal partners to address specific aspects of the ballast water issue. Our federal partners include FWS, the U.S. Coast Guard, the Environmental Protection Agency, the Maritime Administration, the U.S. Geological Survey, and the Department of Defense.

I previously mentioned joint management of the Ballast Water Management Demonstration Program. To demonstrate how we intend to continue and expand coordination, NOAA will give preference in the future to any technology found promising enough to be included in the Coast Guard's Shipboard Technology Evaluation Program (STEP). The STEP program is set up to test promising new technologies under operational conditions. Participants in the program will be exempt from current

requirements for ballast water exchange. In return, they must adhere to a testing/sampling protocol and report results. The Coast Guard has indicated that participants will be individual ships rather than exemptions for a whole fleet.

An interagency working group under the leadership of the Coast Guard has been responsible for the development of United States position on ballast water management at the IMO. The United States contribution to this process has been significant. Over the last year, the United States has been heavily involved in the development of fourteen sets of technical guidelines.

On July 15, 2002, in order to encourage interagency cooperation and coordination on invasive species issues, then Director of the Office of Management and Budget Mitchell Daniels wrote to each of the departments and agencies on the National Invasive Species Council endorsing the development of a crosscutting budget. In developing the crosscut, the executive agencies had to agree on a common set of goals and performance measures, for example, a treatment technology that meets a discharge standard by the end of 2008. The submission to OMB also included regulatory goals and items such as development of protocols for Environmental Testing Verification and preparation of the NOBOB report.

The NOBOB investigation is also a good example of a collaborative effort. Funding was provided by NOAA, the Great Lakes Protection Fund, the U.S. Coast Guard and the Environmental Protection Agency. The study involved investigators from GLERL, the University of Windsor, the University of Michigan, the Smithsonian Environmental Research Center, Old Dominion University and Phillip T. Jenkins and Associates. Overall, this research would not have been possible without the cooperation and assistance of the shipping community especially, FedNav, Polsteam a number of ship operators/owners.

As agencies have worked together on specific issues, the number of informal contacts has increased. In part, this is because personnel in one agency become more familiar with the individuals and resources in another agency. As an example, if the U.S. Coast Guard has a biological question, it does not hesitate to contact NOAA. Ultimately, such informal contacts can save time and money.

Conclusions

We only have to look at the spread of zebra mussels and the continuing effort to manage the sea lamprey to realize that we will be living with the consequences of past introductions. However, we have made progress towards reducing the risks associated with the most significant pathway for introductions into coastal areas—ballast water. The regulatory measures already in place requiring ballast water exchange should reduce the number of new introductions from external ballast water discharges. We are optimistic that ongoing research will lead to a number of promising technologies in the near future.

In many ways, the progress is the result of a virtually unprecedented degree of cooperation by a number of different federal agencies, universities and the private sector. This cooperation has involved advance planning as well as sharing expertise and resources.

This concludes my testimony. I would be happy to respond to any questions that the Subcommittee may have.

Mrs. MILLER. Again, we appreciate you all being here. I'm sure we have plenty of questions for all of you. I might start with Attorney General Mike Cox, if I could.

I know that you've been following this very closely, and you've certainly been a leader in our State, and from a legal standpoint as well in working with the other attorney generals that have concerns in their States as well. Is there any legal authority that the State of Michigan would have, perhaps the DEQ or what have you, to actually board a ship out in the Great Lakes to see if they're in compliance with our State statute?

Mr. COX. Well, Chairman Miller, the recently passed bill, now statute, will allow our Michigan Department of Environmental Quality to board and to permit ships that travel in the Great Lakes. You know, without a doubt, once that starts happening, our statute will be challenged by the shipping industry saying that we're violating their interstate commerce laws. We are confident we can defend that statute, and we are working with a number of other States to come up with model statutes—and furthermore, under the—under this Clean Air Act and Clean Water Act, we worked—our Department of Environmental Quality worked with the EPA already, and has delegated authority. But that being said, and I don't want to be redundant, but there really is a need here first and foremost for Congress to get the EPA to act, OK, for long-term, and in the interim, the Coast Guard.

And it's kind of interesting. I looked at some prior GAO reports or testimony from the U.S. Senate by Doctor Nazzaro's predecessor. And in 2003, it was estimated 70 percent of the ships in the Great Lakes were NOBOBs. Doctor Nazzaro told us it was 80 percent, and then Doctor Brandt told us it was 90 percent, which if anything seems to indicate an increasing vulnerability by the Great Lakes to NOBOB, for the problem of NOBOBs and the need for the Coast Guard to do something now.

The GAO report back in 2003 also pointed out the real problem as to why I and other attorneys generals had to get involved. The Federal efforts don't seem to have clear goals, and there's no way of measuring that they're getting anywhere. You know, the EPA promulgating rules could change all of that, or the Congress forcing the EPA to do that could change all of that.

The result would be, Michigan wouldn't have to worry about this sort of problem. Indiana wouldn't have to worry about this sort of problem; Ohio, Minnesota, Wisconsin. And—because rightfully we have eight States in our union that border the Great Lakes.

And this rightfully should be addressed first and foremost by the EPA. And unfortunately it's been forced upon the Coast Guard by default. You know, the Coast Guard ought to—they're a uniform service, we ought to be allowing to free them up to protect our homeland as they're—which is their primary mission.

So a roundabout answer is yes, we have the means right now. They're going to be challenged in Federal Court, I expect. The best long-term solution is the answer that your committee and the EPA can provide.

Mrs. MILLER. I appreciate that. You know, during the last Congress actually, and this would go to your consternation about whether or not the EPA should take the lead role or perhaps the

process should remain with the U.S. Coast Guard, but during the last Congress, I had introduced legislation in which we would have required that ocean vessels coming into the Great Lakes system would have to have at least a 95 percent discharge of their ballast water before they left the Eisenhower Lock in the St. Lawrence Seaway there. And it would require that the Coast Guard would do the inspections. I've not re-introduced that legislation. My hope is at the end of this hearing, I'll have enough information to fine-tune that. But we held off on that at this time, because of waiting for the Coast Guard to issue their standards. And so, I'm still not certain whether it really rests with the EPA or the Coast Guard. There has to be some triggering mechanism, somebody to actually enforce this. And that would seem logical to me to have the Coast Guard to be the one to enforce whatever Federal legislation we might have. Certainly you don't have the ability to do that with every ship, nor do I think that you'd want to do that, but certainly on a random basis, I think, if we were to get to standards there.

I might ask the Attorney General Cox again, what is your observation of the kind of response, how yourself and your other colleagues have gotten from the Federal agencies that are in the bull's-eye of your lawsuit?

Mr. COX. Well, we won out in the District Court out in California, Federal District Court out in California. The EPA is going to dig in their heels, and that isn't the end of the battle by any means. And we're going to have to pursue this.

And quite frankly, I myself, philosophically as a lawyer, feel uncomfortable having to sue a Federal body to perform its federally mandated role. But in large part it's become a matter of self-defense for States along the Great Lakes. And we've unfortunately had to go the route of, you know, going to the courts. And the EPA is digging in, and they're not changing in the short run. Hopefully your hearings will provide a little persuasion.

Mrs. MILLER. Madam Moore, you are in the hot seat today, but if I could address that question to you? When do you think the Coast Guard would be effective to issuing a discharge standard? Perhaps you could enlighten us on that.

Commander MOORE. September 2003, we issued a notice announcing our intent to publish an Environmental Impact Statement. That was the second step that we had taken in the rulemaking development process for the discharge standard rule. We had done it with advance notice of proposed rulemaking just prior to that, to which we have received 40 comments to the docket.

We are currently receiving chapters of that EIS and reviewing them. We're having the work done outside the Coast Guard at this point. We are very much expecting in the next several months, few months, to be able to issue the Environmental Impact Statement.

That Environmental Impact Statement, as you know, is a NEPA, National Environmental Policy Act requirement to support—it's one of the supporting documents required for Federal rulemaking. A NEPA document can be a number of different levels, depending on the environmental impacts of the rule itself. And the environmental impacts of the ballast water discharge standard could be so significant, that the full, long analysis called the Environmental

Impact Statement is the work required under this rule. We are completing that.

We are also currently completing a cost-benefit analysis and regulatory analysis that are also required documents to support the rule. As well, we are working with our Federal agency partners, EPA, NOAA, Fish and Wildlife, in making sure that our science is defensible, it's valid, it's excellent, and it's correct before we issue this discharge standard.

As well, we're working with the stakeholders in terms of trying to get a handle on what the cost of this rulemaking would be on the United States, and making sure that we have the adequate benefits achieved by setting a particular discharge standard at a level to offset the cost of the ruling. I guess the next—the most near term time line or milestone that we're going to see, is the publishing of the Draft Problematic Environmental Impact Statement. And that's yet some several months away.

Mrs. MILLER. The short answer would be, then, that perhaps in 18 months, 2 years? And once it is—you do have the standard, how long would it actually take to implement such a thing? Do you have any idea there.

Commander MOORE. Once this standard is established, it will come out essentially two times. It will come out as a proposed rule, notice of proposed rulemaking, and that standard then would be published out for the first time. The environmental process will give the results of the analysis of definite alternatives.

Once the standard is announced and the rule itself, we'll also have an implementation schedule. In other words, what vessels it will apply to on what scheduling. That implementation schedule will tell vessels then when they can expect to have approvable equipment installed on board that would be able to discharge to meet that standard.

It's important to know that the discharge standard serves two roles, and they're very different, and they're very important.

The ballast water discharge standard's first role is to help the Coast Guard evaluate the performance of ballast water treatment technologies. Right now, under the NISA/NANPCA language, a system, in order to be approved by the Coast Guard, has to be as effective as ballast water exchange in reducing the risk of aquatic nuisance species introduction. And as we've already heard, ballast water exchange has a range of effectiveness.

One of the reasons why the Coast Guard made a decision to move toward the ballast water discharge standard, was to lock in that performance standard for ballast water treatment systems to be able to meet.

The other role that the ballast water discharge standard will have, though, and one great benefit that it has in terms of the regulatory issue, is it gives us an ability to determine that the discharge from the system on the vessel is compliant through the life of the vessel. So that we know once installed approved equipment is on board, it is also continuing to function as it's designed. And that dual role of the discharge standard is a very important element of having a discharge standard, and not having the systems that are approved separate from having a discharge standard.

Mrs. MILLER. Commander, you spoke, you mentioned several times that the concentration approach is the preferred approach. Could you explain a little bit what is meant by that term concentration approach.

Commander MOORE. Certainly. The way the concentration approach works essentially, is a family of organisms. Typically we're looking at families established certainly by a time—I'm sorry, by a size range. In the international, that size range is greater than 50 microns, organisms greater than 50 microns. That's technically zoaplank, and all the way up to fish. And then organisms smaller than 50 microns but greater than 10 microns, that is the organisms that tend to fall in the bicrondic category. And then, finally, there's a third category that are the microbes or bacteria kinds of organisms, and those are also in a concentration-based standard.

So that the way the standard would work, is that per volume of ballast water discharged, only a—no more than a maximum number of organisms—or, less than a max number of organisms would be permitted in that volume of discharge. And so that's a samplable quantity in a laboratory setup under an approving system, and then it is also a sample of water quality.

Mrs. MILLER. Thank you.

Representative Lynch.

Mr. LYNCH. Thank you, Madam Chair.

First of all, Commander, I want to say thank you for your service to our country. It is deeply appreciated. I have a great relationship with my Coast Guard commander in the port of Boston.

I notice that yourself, and actually Ms. Nazzaro, point to this convention, this International Maritime Organization Convention. And I'm just concerned. I know the situation that we have right now in the Great Lakes and other coastal areas. I know the amount of encroachment we've had with invasive species. And I'm looking here at, for instance, the amount of time it's taken for us to develop the standard, and we're not there yet. It began in 2001, and we still have I don't know how long to go. But I'm just seeing a very quick encroachment and the possibility of irreversible damage to the Great Lakes, and yet this bureaucratic process just goes very, very slow or on different time lines. And it concerns me greatly.

And then I see here that, first of all, the conference adopted the International Convention which it calls upon, it calls upon shippers, shipping companies, vessels to adopt certain standards. Is that—when you say calls upon, and I notice yourself and Ms. Nazzaro used the exact same sentence, is this mandatory?

Commander MOORE. Yes, sir, the convention is mandatory.

Mr. LYNCH. The convention is mandatory.

Commander MOORE. The convention is mandatory for parties. In other words, if a country ratifies, and then sufficient countries with sufficient shipping gross tonnage ratify the convention, then that treaty then enters into force, the parties are bound by the mandatory requirements of the convention, yes.

Mr. LYNCH. OK. Well, that's encouraging. And the other thing that troubled me was, it talked about calling on ships to meet a ballast water discharge standard according to a schedule of fixed dates, beginning with ships constructed in 2009.

Commander MOORE. Yes, sir.

Mr. LYNCH. Do you see the problem with that? If we don't apply the standard until—or, if we end up with a situation where ships are not under the burden of this regulation unless they're constructed in 2009, and if the average life of one of these vessels is 30 or 40 years, then even out in 2030, 2040, we have a very small percentage of the vessels that are going to be subject to this rule, and the rest are out from underneath the protection that you and I and the rest of us are trying to provide.

Commander MOORE. Yes, sir. The schedule of fixed dates begins with vessels newly constructed in 2009. But the existing vessels that you are concerned with, begin to come under the coverage of that standard beginning in 2012, and then on until all vessels are under the standard by 2016.

And the reason for that, sir, is the quantity and number of vessels, just shear number of vessels that we have to install equipment, and the challenges faced by existing vessels retrofitting equipment into confined areas in their engine rooms, say, that and overcoming the challenges of retrofitting significant equipment on existing vessels. That's why the use of existing vessels have a longer time line with which to be able to design, purchase and install this equipment.

Mr. LYNCH. I understand.

Commander MOORE. Existing vessels are covered.

Mr. LYNCH. So, Commander, what you're saying, is that by putting this out there, the manufacturers, at least the ships and the ballast systems themselves, they'll be influenced by this regulation, and so they'll modify them in a way that they won't be the honeycomb design that they are now, which is very tough to flush and very tough to clean out, and that are prone to carrying sediment; they'll be influenced so that we'll be able to adapt the new technology to those vessels.

Commander MOORE. Sir, what we're seeing, are a number of adaptations on several different levels. First, I think in terms of ballast water treatment systems under development, ballast water treatment systems, many of them, if not most of them, have either a filtration or separation component to them so that the accumulation of sediment is going to be dramatically reduced as the installation of these systems proceeds.

Many of the systems are actually an in-line system. In other words, they're going to be dealing with the organisms in the ballast water while they are being pumped aboard or overboard of the vessel. So the actual need to modify the tank structure, which would be very expensive in these vessels, is not going to be needed. The honeycomb structure of the ballast tanks, the advantage to that is that it allows for smoother cargo spaces and the efficient loading and offloading of cargo. So having the structure within the ballast tanks, is actually a good thing. It's tough for ballast water exchange effectiveness, but if we are able to treat the ballast water before it gets into the tank, then that honeycomb structure no longer becomes an impediment.

Mr. LYNCH. OK. Very good. And the question is generally for all four panelists. And I do appreciate, as the other Members do, your appearance here. Are there technologies that you see in grappling

with this problem? Do you see some technologies that offer greater promise than others?

Ms. NAZZARO. Yes.

Commander MOORE. Yes, sir. I'll just go first. We are seeing a tremendous growth in the development of novel technologies. I think we're seeing a great deal of input from water treatment industries that have typically performed outstanding work on land trying to adapt themselves to the maritime environment. Of course a ship environment is very difficult. But you're seeing filtration technologies, the adaption of ultraviolet light for the disinfection; you're seeing chemical oxidizing and non-oxidizing biocides being used. There's a number of non-chemical biocide type treatments, where either the oxygen is removed from the water, or some other water chemistry changes are being effected on the water so that it does not—no longer supports those organisms. As we heard Doctor Brandt testify, there are a number of organisms that are very tough to kill. And we are exploring what are those response relationships between some of these treatment systems and the organisms themselves. So there's still a great deal of developing work. And the industry is certainly in its development stage. There are a number of treatment systems that are showing promise, have been installed on ships, are being actively, very thoroughly tested right now.

Mr. LYNCH. OK. Thank you.

And if I could, Mr. Brandt, I know that you mentioned in your testimony there are various studies out there in terms of even the efficacies of using this—what do they refer to it, swish and spit, where they bring in the salt water and get the loose—the residual water in the ballast tank.

Are you suggesting there that there should be more studies done around that, that aspect of this?

Mr. BRANDT. Yeah. I think that what we've seen by interviewing the shippers, is that some of those ships that do use that swish and spit, which particularly if they bring water in shortly after they've had sediment brought on board, they were in a turbid area taking on ballast water. If they can rinse that out right away before that sediment becomes hard, those kind of ballast water management strategies can be very effective at reducing the amount of sediment.

There's the similar sort of an argument could be made for taking on salt water and swishing it around, and having salt water overlying the sediment rather than the fresh wash. I think those are techniques that can be applied right away and could be effective.

One of the things, though, that we've noticed, that some of these animals are very hardy. Their resting eggs can withstand no oxygen in water, they can go through a fish's digestive tract. They can live for decades. And once they get back into the water, they can resurface and grow. And those animals are hard to kill.

Mr. LYNCH. OK. Thank you.

And last, Attorney General Cox, I notice in your testimony you were fairly critical, deservedly I believe, of Senate bill 363, that would prohibit the State of Michigan which came up with a very innovative way to categorize this problem, this pollution——

Mr. COX. Right.

Mr. LYNCH [continuing]. And to get at it through the EPA. A very—I think it's instructive, and I'm going to bring it to the attention of my folks in Massachusetts.

In terms—and it also, 363, at least the plain reading of it, would prevent the EPA from regulating ballast water discharges under the Clean Water Act.

Mr. COX. Right.

Mr. LYNCH. It's the same preemption argument. What about the idea that if the Coast Guard comes up with its standard and Michigan wanted to do more, wanted to do more than what the standard might require? As the chief law enforcement officer for the State of Michigan, what is it your opinion that—what would that do to your wishes to be more protective of the Great Lakes?

Mr. COX. Well, Congressman, I think part of my opposition to the Senate bill 330—or excuse me, 363 not allowing the States to have any role, is the part of that same bill that in essence says don't apply the Clean Water Act, and don't do a number of the things we need to rectify the situation right now. And my opposition, based upon not allowing the States some role, you know, might completely disappear if we could get the EPA to do what it should have been doing all along. I mean, it's a very practical political matter.

This is a problem I think we, at the States, would rather not even have to worry about. It's only because it's dropped at our doorstep and we aren't getting the sort of Federal response that is needed, that we argue for a role for States.

You know, I understand there's—you know, it's a very complicated problem. But as I look at the time line here, you know, in 1990 with the Nonindigenous Aquatic Nuisance Prevention Control Act, 1999 President Clinton's EO, 2001 the task force finally starts up. And maybe in 2012 there might be some relief on existing ships with regard to NOBOB. So that's 22 years that the Great Lakes are taking it on the chin maybe waiting for some Federal action. And again, that's why us States have to—why we're forcing ourselves up to the table.

Mr. LYNCH. OK. Thank you. I yield back.

Mrs. MILLER. Thank you.

Representative Westmoreland.

Mr. WESTMORELAND. Thank you.

And, Commander, let me compliment you and the Coast Guard for the job that you're doing on the gulf coast too, but I would like to ask you a couple of questions.

I notice that there are three different ways, I guess, that—or procedures on exchanging this ballast water. One says prior to discharging ballast water in U.S. waters, perform a complete ballast water exchange, and in an area no less than 200 nautical miles from any shore, retain ballast water on board the vessel. Or prior to the vessel entering U.S. waters, using an alternative environmentally sound method of ballast water management that has been approved by the Coast Guard.

If these ships don't do that, it says there's a fine levied for $27,500 per day that this ship has not performed one of these. And I think the figure's been given that there was about a 90 percent compliance rate.

How do you know that?

Commander MOORE. Sir, we get on board every ship carrying ballast water and entering into the Great Lakes. And we evaluate a random sample of the tanks on board to insure that the salinity in those tanks reflects the salinity representative of mid-ocean water versus the salinity representative of coastal brackish or fresh water.

Mr. WESTMORELAND. So you actually board the ships.

Commander MOORE. Yes, sir.

Mr. WESTMORELAND. Have you had to issue any fines?

Commander MOORE. No, sir. There's a practical collision with actually ending up issuing a fine for a vessel that has not completed an exchange. We have a reporting requirement that before they enter the system, we have a report from them on what the vessel actually did. If they for some reason have a tank that they have not completed an exchange on, what they will do is then they will say that they have no intention to discharge the contents of that tank. One of the advantages that we have, is the ability then to give them an order that says that they cannot discharge the contents of that tank and then determine on their exit by both the quantity of ballast water in that tank and again measuring the salinity in that tank, to determine that it's not say completely fresh Great Lakes ballast water; that they have in fact not discharged the ballast water into the Great Lakes. So by virtue of the system that's set up in terms of reporting, sampling and enforcement, we haven't had an opportunity, if you will, to actually exert a fine in the Great Lakes system.

There are new regs in place obviously nationwide. There have been some fines and tickets associated with compliance around the country. But the Great Lakes is a unique kind of a system with an entry into the system. And we've been—had no fines within the Great Lakes.

Mr. WESTMORELAND. So what you're basically telling us, is that you feel like the Coast Guard regulations right now are 90 percent successful, and that all of the problems that are happening in the Great Lakes is coming from that 10 percent that are not compliant.

Commander MOORE. It's interesting to think about the influx of ballast water into the Great Lakes, but that is really only part of the contribution of nonindigenous species into the Great Lakes. In terms of shipping, vessels also have some fouling associated with shipping, and so there might be other places on the ship that organisms completely unrelated to ballast water may be carried into the system. And there are also other sources of nonindigenous species into the Great Lakes completely separate from Great Lakes shipping. So I don't think that you can actually ascribe the increased rate of invasions completely to ballast water. While there is, as we've already discussed, the risk because some of these unmanaged residuals turn out to be—some fraction of them turn out to be fresh or brackish water and may have organisms that are compatible with the Great Lakes, that's probably not the sole source of nonindigenous species into the Great Lakes.

Mr. WESTMORELAND. So what would you say was the percentage of these invasive non-natural species coming in that comes from ballast water.

Commander MOORE. I have no way to make that assessment. The only thing I can do, is reduce the risk or eliminate the risk that ballast water is contributing noninvasive—or, nonindigenous species into the Great Lakes.

Mr. WESTMORELAND. Attorney General Cox, you seem to be a sportsman that enjoyed the outdoors. Are there any natural predators for the—what is it, the round oby or——

Mr. COX. The goby? No.

Mr. WESTMORELAND. The goby.

Mr. COX. No. The zebra mussel. Some folks think that there's some natural predatation evolving, but Doctor Brandt might have a better idea than I do of that.

But I think that brings up a point that is very germane to this issue about aquatic nuisance species. By and large, we don't have scientists arguing about whether this is a good idea or a bad idea. This isn't like global warming where people talk about, you know, increased regulations of CO2, you know, whether global warming's related to that, or whether CO2's that bad or not. By and large that I know of, there's no scientists who say these species are good for us or good for the Great Lakes.

So I think it's against that context, or I would hope it's against that context, that everyone approaches what the EPA and the Coast Guard, or whatever part of the Federal Government engages this problem, you know, how they approach their timelines.

It's just, you know, this is—this is a problem that keeps dumping itself into the Great Lakes. You know, 10 percent of the vessels not being compliant. Congressman Miller knows better than I, but if you drive 15 miles from here to Port Huron, and you can watch within an hour, on any given hour you can watch tens if not hundreds of vessels go by, and you start to realize 10 percent matters; 8 percent matters.

So again, I'm getting back to your original question, I don't believe there's any natural predators. There's some thought that there might be, but again that's probably Doctor Brandt would know better than I.

Mr. BRANDT. I'd like to try and address that a little bit. The goby actually and the zebra mussels came from the same region. In fact, when the zebra mussel came here first, followed by the goby, the goby came into a habitat where it had its natural food, which in some sense is a zebra mussel. So what the goby has done, is they also feed on other fish that compete with a number of the fish and natural species. Yellow perch is one of those examples.

One thing to be remembered, though, is that eradication of these species, except immediately after their appearance—but once they've entered the Great Lakes and have become established, eradication is almost impossible. We've had great success in trying—at great cost, in trying to control the sea lamprey. But we've not eradicated any other species in the Great Lakes that has become fully established.

And I think what those folks that manage fisheries and that are—the problem they face, is that the entire ecosystem is changing. Every time a new species comes in and takes over, the system has changed. And they need to look at their regulations, the way

they manage the system in that way. And that's a very difficult thing to do.

Mr. WESTMORELAND. Now, Doctor Brandt, one final question, Madam Chairman. You mentioned the sea lamprey. I know that they are treating that with a chemical or a spray I guess. Has there been any research into any of these other species, such as the zebra mussel or the goby.

Mr. BRANDT. There's a lot of research to try and control them in areas where they're causing a lot of problems, like intake of water—municipal water sources or power plants, and there's ways to control those. There's means that can be used to reduce their attachment to these solid structures.

There's a very interesting research in Australia that is looking at genetic techniques that are trying to control the species once they've become established. None that's going on in the United States at present.

Mr. WESTMORELAND. Well, thank you for each one of you commenting, coming in and testifying today.

Ms. Chairman, that's all the questions that I have.

Mrs. MILLER. Thank you. And I want to thank all the panelists for appearing today. And if any of the Members have any further questions of them, you can certainly submit them, and then we'll have them respond and made a part of the congressional record here for the subcommittee.

Again, as well, we want to thank you all for coming, and we'll take a brief recess while we impanel our next group of witnesses.

Thank you so much.

[Recess.]

Mrs. MILLER. All right. We're going to restart our hearing here.

And once again, because the Government Reform Committee is an oversight committee and has subpoena authority, we ask that you please stand and raise your right hands.

[Witnesses sworn.]

Mrs. MILLER. Thank you very much.

Our first witness today is Mr. Dennis Schornack. Mr. Schornack was appointed to chair the U.S. Section of the International Joint Commission by President George W. Bush, and he assumed the office on April 8, 2002. And during his tenure at the IJC, he has focused on the problem of aquatic invasive species, and he's testified on the subject both before the U.S. Congress and the Canadian Parliament.

Mr. Schornack's leadership of the IJC caps a 25 year career at the top levels of the State government, including 11 years in senior positions for Michigan Governor John Engler.

Most notably, he co-led the development of Annex 2001, which is an agreement among the eight Great Lakes States and two Canadian provinces to manage Great Lakes water uses and diversions.

He earned his B.A., B.S. and Master's degrees from Michigan State University, as well as a Masters in public health from the University of Michigan.

We appreciate you coming today, Mr. Schornack, and look forward to your testimony, sir.

STATEMENT OF DENNIS L. SCHORNACK, CHAIRMAN, U.S. SECTION INTERNATIONAL JOINT COMMISSION

Mr. SCHORNACK. Thank you, Chairman Miller, and members of the subcommittee. I appreciate the opportunity to appear before the subcommittee today.

And I particularly want to commend Chair Miller for convening this session at a high school, because you're exactly right, the key to being a good steward of the Great Lakes, is a great education. And what students learn today, will be reflected in healthier, better managed, more sustainable lakes tomorrow.

I also commend you for your leadership on many critical issues confronting the Great Lakes, from invasive species, to toxic spills, to the erosion in the St. Clair River. You've been a staunch defender of the Great Lakes, and your work is greatly appreciated.

Like you, though, I'm increasingly frustrated at the slow pace of progress to reduce the risk of invasion, and thereby protect the Great Lakes from alien species. In my view, aquatic invasive species are the No. 1 threat to the biosecurity of the Great Lakes, and it's time for everyone who cares about the Great Lakes to stand up, and speak out, and with one voice tell Washington and the Congress to do something and to do it now.

What is it that we should ask Congress to do? To me, it's obvious that congressional action and oversight are required to speed up the process, to cut through the confusion of competing approaches, and to set a clear, protective discharge standard, and to set clear lines of authority and responsibility.

If we've learned one thing in the wake of Hurricane Katrina, it's that solving problems becomes exponentially harder when multiple agencies are in charge or think they are in charge. The result: everybody and nobody is in charge. Conversely, seemingly intractable problems can be successfully tackled when authority, resources and responsibility are focused in one agency. And in the case of aquatic invasive species, I believe that agency is and should remain the U.S. Coast Guard.

Our goal of keeping the Great Lakes closed to invasion but open to commerce, is being pursued along several regulatory pathways at the international, national, and subnational levels. These treaty-based administrative and legislative pathways have been described in part in previous testimony.

And with each of these regulatory pathways, the key step is setting a ballast water discharge standard. Setting a successful standard requires the following basic elements, in my opinion: First and foremost, the standard must be biologically protective of the Great Lakes. In short, it has to work.

Second, it must be enforceable, meaning that the test to meet the standard must be quick, it must be simple, and it must be without ambiguity.

Third, it must be fairly applied to all ships capable of carrying ballast water.

Fourth, it must be achievable either by technology, the use of an environmentally benign biocide, or some management practice, or a combination of these factors.

And last, but of no less importance, the standard must be coordinated with Canada to allow for maximum protection of the lakes

and the maximum opportunities for cooperative testing and efficiencies in enforcement. Ideally, the standard should be the same, because invasive species recognize no boundaries.

These actions would position the United States as a world leader in the protection of a world-class resource. However, the Great Lakes are a shared resource. So to be effective and fully protective of the lakes, these actions must be coordinated with Canada.

Frankly, I think this gives our two countries the perfect opportunity to examine their policies as part of the review of the Great Lakes Water Quality Agreement that was just about to commence this January. A review process would allow the two parties to step back from the day-to-day needs of management programs, to develop a harmonized, coordinated approach, based on a single standard. To me, if a new Great Lakes Water Quality Agreement achieves a common strategy between our two countries on an aquatic invasive species, it will be a resounding success.

Finally, the subcommittee should be also aware of other ways to stop the discharge of untreated ballast water in the Great Lakes. An example is the transshipment of goods from ocean vessels to lakers prior to their entry into the Great Lakes. Goods that could not be transshipped to vessels might be moved to trucks and railroad lines. In this regard, a recent study by Doctor John Taylor of Grand Valley State University—I believe he's in the audience today—revealed that the estimated additional cost of this option would be roughly $55 million per year, an amount that was far less than the annual cost to water and power industries attributed to invasive species.

Now, I mention this alternative, because this study sets a benchmark for the cost of any regulation this Congress or the Coast Guard might adopt. If regulatory compliance costs are greater than $55 million per year, then transportation modes for these cargos may shift.

Congress and regulators must be aware of such impacts, so that they can be fully informed and prepared to make the decisions needed to protect both the economy and the ecology of the Great Lakes.

Thank you again for the opportunity to express our views, and I certainly look forward to answering your questions.

Mrs. MILLER. Thank you very much, Mr. Schornack.

[The prepared statement of Mr. Schornack follows:]

Written Testimony of
DENNIS SCHORNACK, CHAIRMAN
U.S. Section, International Joint Commission
Subcommittee on Regulatory Affairs
Committee on Government Reform
U.S. House of Representatives
Friday, September 9, 2005

Chairman Miller, I appreciate the opportunity to appear before your subcommittee and I commend you for convening this session at a high school. Because you are exactly right, the key to being a good steward of the Great Lakes is a great education. What students learn today will be reflected in healthier, better managed, more sustainable lakes tomorrow.

I also commend you for your leadership on many critical issues confronting the Great Lakes. From invasive species to toxic spills, to erosion in the St. Clair River, you have been a staunch defender of the Great Lakes, and your work is much appreciated.

As I begin, I should note that my comments this afternoon are my personal views as a conservationist who grew up on Saginaw Bay and has worked on Great Lakes issues for the past 25 years. They do not necessarily represent the views of the International Joint Commission.

The challenge of closing the Great Lakes to invasive species while keeping them open for commerce is being addressed at local, state, federal and international levels with varying prospects for success. There certainly is a role for each level of government, for individuals and for industry in the battle to stop the inflow of invaders that threaten our lakes.

Today, we have heard and will be hearing of ongoing efforts to stop the import of invasive species via the ballast water discharges from ocean-going ships. Like others here today, however, I am increasingly frustrated at the slow pace of progress to reduce the risk of invasion and thereby protect the Great Lakes.

Aquatic invasive species are the number one threat to the biosecurity of the Great Lakes, and it's time for everyone who cares about the lakes to stand up, speak out, and with one voice tell Washington – do something and do it now!

What is it that we should ask Washington to do? To me, it is obvious that Congressional action and oversight are required to speed up the process, to cut through the confusion of competing approaches, to set a clear, protective discharge standard, and to set clear lines of authority and responsibility.

If we learned one thing in the wake of Hurricane Katrina, it is that solving problems becomes exponentially harder when multiple agencies are in charge or think they are in charge. The result? Everybody and nobody are in charge. Conversely, seemingly intractable problems can be successfully tackled when authority, resources and responsibility are focused in one agency. In the case of aquatic invasive species, that agency is and should be the United States Coast Guard.

I Our goal of keeping the Great Lakes closed to invasion but open to commerce is being pursued along several regulatory pathways at the international, national and subnational levels. These treaty-based, administrative and legislative pathways have been described in previous testimony.

With each of these regulatory pathways, the key step is setting a ballast water discharge standard. Setting a successful standard requires the following basic elements:

- First and foremost, the standard must be biologically protective of the Great Lakes. It has to work.
- Second, it must be enforceable, meaning the test to meet the standard must be quick, simple and without ambiguity.
- Third, it must be fairly applied to all ships.
- Fourth, it must be achievable either by technology or management practice or combination thereof.
- Lastly, but of no less importance, the standard must be coordinated with Canada to allow for maximum protection of the lakes and maximum opportunities for cooperative testing and efficient enforcement. Ideally, the standard should be the same because invasive species recognize no boundaries.

Much time has passed already and the Great Lakes have waited long enough for action, but nevertheless, there must be a fair, but clear schedule for implementation so that shippers are able to comply. In the interim, however, there must be intermediate management steps to reduce the risk of AIS introductions.

Earlier, Commander Moore described the current regulatory pathway under the 1996 National Invasive Species Act. This act gives the Coast Guard the authority to develop regulations and guidelines to prevent the introduction of invasive species via ballast water discharges. These regulations require ballast water exchange for all ballasted vessels. The standard is salinity – 30 parts per thousand, the same as seawater.

However, when inbound ships declare "no ballast on board" they are exempt. To address this exception, the Coast Guard's recent action to establish an additional, voluntary best management practice that recommends vessels declaring NOBOB to conduct a saltwater flush outside the U.S. EEZ is a step in the right direction. Just as important will be additional monitoring to see whether ships are achieving the 30 ppt salinity standard in residual ballast water.

This is vitally important because as we heard from Steve Brandt, NOAA's seminal NOBOB report concluded that:

> "We assign the greatest risk to NOBOB vessels that enter the Great Lakes containing fresh or low-salinity residual ballast water and urge that methods to eliminate this risk be developed as soon as possible."

It appears that the Coast Guard is paying attention and is putting this advice to work.

Moreover, the Coast Guard should be commended for their work leading the negotiations resulting in the 2004 ballast water convention of the International Maritime Organization – a branch of the United Nations. However, despite the insistence of Coast Guard negotiators, the standard the IMO adopted is weaker than what the U.S. wanted and has been questioned by many experts as not being fully protective of the Great Lakes.

What's important to note is that U.S. negotiators did succeed in making sure the convention allows member nations to implement tougher standards to protect sensitive areas like the Great Lakes. And I fully expect that the Coast Guard will implement a standard that will be tougher and more protective than the standard adopted by the IMO.

But this path raises possible concerns – the timeline is long and uncertain, the standard remains to be set, and the Coast Guard does not have clear cut regulatory authority that would be afforded by a discharge standard written in law. The quickest, clearest most direct route to protecting the Great Lakes is for Congress to set a standard and to set it now.

There are at two pieces of pending legislation that would accomplish this goal – the proposed National Aquatic Invasive Species Act of 2005 (S.770) and the Ballast Water Management Act of 2005 (S.363).

Another regulatory path has been imposed by a federal district court in San Francisco. There, a judge has determined that ballast water is subject to regulation under the federal Clean Water Act. Her ruling creates confusion and uncertainty that I fear will actually delay progress toward protecting the lakes. For example,

- It would put a different agency with no experience or authority with ships – the USEPA – in charge.
- For the first time, it would impose a permitting program designed for fixed sources of water pollution on mobile ones.
- The Clean Water Act allows for states to set their own different standards, creating the potential for a patchwork quilt of regulations.
- It would subject international commerce to individual state action.
- And appeals of this decision will delay action as will potential citizen lawsuits.

Congress must clear up this confusion – put the Coast Guard in charge and set a standard. It's that simple.

These actions would position the U.S. as a world leader in the protection of its waters – most specifically the Great Lakes. However, the Great Lakes are a shared resource, so to be most effective and fully protective of the lakes, these actions must be coordinated with Canada.

Here, I should note that Canada is in the process of adopting regulations that roughly conform with existing U.S. regulations requiring mandatory ballast water exchange. Similar to the U.S. path, the timeline is long and it isn't clear when ballast water exchange will sunset and treatment will become mandatory. Moreover, while the new Canadian regulations cover NOBOBs, it is not clear how the rule will be enforced and there have been concerns expressed

by the U.S. over the identification of alternative discharge zones in coastal areas in which ballast water exchange would be allowed.

That's just a very complicated way of saying that the details of how the program would actually work have yet to be determined. Frankly, I think this gives the two countries the perfect opportunity to examine their policies as part of the review of the Great Lakes Water Quality Agreement. The review process will allow the two parties to step back from the day to day needs of managing programs to develop a harmonized, coordinated approach based on a single standard. To me, if a new Great Lakes Water Quality Agreement achieves a common strategy on aquatic invasive species, it will be a resounding success.

Finally, the subcommittee should also be aware of other ways to stop the discharge of untreated ballast water in the Great Lakes. An example is the transshipment of goods from ocean vessels to Lakers, prior to their entry into the Great Lakes. Goods that could not be transshipped to vessels might be moved to trucks and railroad lines. In this regard, a recent study by Dr.. John Taylor of Grand Valley State University revealed that the estimated additional cost of this option would be roughly $55 million annually, an amount far less than the annual cost to the water and power industry attributed to invasive species.

I mention this alternative because this study sets a benchmark for the cost of any regulation this Congress or the Coast Guard might adopt. If regulatory compliance costs are greater than $55 million per year, then transportation modes may shift. Congress and regulators must be aware of such impacts so that they can be fully informed and prepared to make the decisions needed to protect both the economy and the ecology of the Great Lakes.

Finally, thank you again for the opportunity to express my views, and I look forward to answering your questions.

Mrs. MILLER. Our next witness is Kathy Metcalf. She serves as the director of Maritime Affairs for the Chamber of Shipping of America, which is a national trade organization that represents U.S. interests in the maritime industry. Its members are composed of operators, owners and charters of tankers, chemical carriers, containerships and bulk carriers that are either U.S. flagged or have interests in the continued viability of the U.S. maritime industry.

She has sat in this position since 1997, and in her capacity represents maritime interests before Congress and Federal and State agencies and in the international arena as well.

Prior to coming to the Chamber of Shipping, she served in various positions in the energy industry, including deck officer aboard large ocean-going tankers, marine safety and environmental director, corporate regulatory and compliance manager, and State government affairs manager.

We appreciate you coming in today, Mrs. Metcalf, and we look forward to your testimony.

STATEMENT OF KATHY METCALF, DIRECTOR, MARITIME AFFAIRS, CHAMBER OF SHIPPING OF AMERICA

Ms. METCALF. Thank you, Madam Chairman. It is a pleasure to be back in high school. And at our age, it is always a good feel.

While I'm presenting my testimony today on behalf of my organization, I think I want to make the point that we are but one of a number of organizations that are members of an informal shipping industry ballast water coalition. And my colleague to my left, Mr. Weakley, as well as other organizations, have put that organization together, informal as it may be, well over 3 years ago, when we sensed the need for the industry, the entire industry, not just this trade association or another, to really get off the line, off the mark if you will, and move forward on this issue.

Now, while I have not cleared this testimony through them, I will ask the recognition of the Chair, that attached to my written testimony is coalition testimony I presented on June 15th to the Senate Commerce Committee, which serves as really the foundation of my testimony today.

It is absolutely reasonable that this hearing be held here, because unfortunately, this area was the first documented—one of the first documented victims of invasive species in the United States. And because of that, I think there's an appreciation in this region, there's an absolutely critical need for a strong national program—actually, a strong international program. But given the variations and the speed of various international initiatives, it certainly is understandable in the part of the United States and some of the regions within the United States, that a national program at the very least be established.

It's important that it be at least a national program, because it needs to regulate an international business. The colleague to my right has mentioned Canada and the United States. But the bottom line is that some of these critters, if you will, have the ability to float in currents and whatnot over long, extended periods. And it's important that we have an international system because the critter

in New Mexico that's not controlled may become our next invasive species as well.

For 20 years, the industry's been working on this internationally, and at national levels as well as State agencies. And the basic industry position has four elements. One is, as I indicated, a mandatory national program.

A strong Federal program has been espoused by three State environmental agencies of which I have worked with this problem. They didn't want these strong Federal programs (sic), so the States individually do not have to create the same thing perhaps with different results.

The second is a need, absolutely critical need for a quantitative ballast water standard that's based on concentration.

The third is we need to get stuff on the ships. What works great in the laboratory but doesn't work on a ship, is of no benefit to us in the long-term.

And finally, understanding the delicacy of this terminology even in Washington, but particularly at a field hearing, there is a need for Federal preemption in this issue for a lot of reasons; not the least of which is to promote the consistency in a national program and, therefore, promote the compliance of vessels as they call on U.S. ports.

I'm happy to say today that the IMO convention achieved all of those but the preemption. Thank goodness they didn't deal with national preemption on a national treaty.

But I'm even happier to say today that Senate 363 does deal with it. It does not shut States out from participating in the process of creating a standard. It simply says that once the Federal Government has agreed on a standard with input from all State levels, that it will become the national program.

Why should we preempt State initiatives? Well, the past argument, put quite simply, is the reason. Ships travel across boundaries. So do invasive species. Let's control them the right way, and in a way that's predictable to not only business, but also to the environment, so we can do good right now, as soon as possible.

Treatment technologies, as indicated by previous witnesses, there's a lot of them. The one thing we can all agree on, is there is no silver bullet that would provide the necessary efficacy on all ships on all voyages in all water bodies. So there's a need for the development. And it is happening.

Once the IMO convention placed—put in place a quantitative standard, it happened that the vendors and ship owners began to work together. And I'm quite proud that three of our member companies actually are testing three separate technologies on three different types of ships in three different geographies, one of which is the Great Lakes.

Finally, I would just say on the need for a quantitative standard in any program, if we can visualize someone in a dark room shooting at a target that's not there with their eyes closed, that's what the agencies, both State and Federal, the shipping industry, the environmental groups have had to deal with prior to the creation of a numerical standard. We now have a target. The lights are beginning to come up in the room, and we're beginning to focus in on achieving that.

And finally, as far as the necessity for the Federal statute to be the controlling statute for ballast water, the Attorney General from Michigan indicated the suit. Well, we are also interveners in that lawsuit on the other side. And we believe it's important to create a system of management for ballast water. We do not believe the NPDS program was created nor intended to apply to sources that move across jurisdictional boundaries.

The best example I can think of right now, would be if we suddenly decided that rather than create Federal automotive emission standards, that every State would permit every vessel that went through it, as opposed to a Federal standard by which we can all rely.

So again I thank you. We are committed to working with the Federal agencies and the Congress, and hopefully moving Senate 363 to a successful conclusion, and I'd be happy to answer any questions you may have.

Mrs. MILLER. Thank you very much.

[The prepared statement of Ms. Metcalf follows:]

STATEMENT FOR THE

SUBCOMMITTEE ON REGULATORY AFFAIRS

OF THE HOUSE

COMMITTEE ON GOVERNMENT REFORM

ON

FRIDAY, SEPTEMBER 9, 2005

PRESENTED AT

FAIR HAVEN, MICHIGAN

PRESENTED BY

MS. KATHY J. METCALF

DIRECTOR, MARITIME AFFAIRS

CHAMBER OF SHIPPING OF AMERICA

Madame Chairman, we appreciate the opportunity to testify before you today on the subject of ballast water and the impact of invasive species.

The Chamber of Shipping of America is a maritime trade association composed of members which own, operate and/or charter large commercial vessels engaged in both the domestic and international trades. Our members operate a number of vessel types engaged in trade worldwide, including vessels trading to the Great Lakes.

While I am presenting this testimony today on behalf of my own organization, let me say that we are but one of a number of participants in the Shipping Industry Ballast Water Coalition (the "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% of the vessels calling in US 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 I am presenting this testimony today on behalf of my own organization due to time constraints inherent in clearing this testimony with the entire Coalition, the basis of this testimony is rooted in fundamental concepts espoused in the Coalition's testimony I presented at a June 15, 2005 invasive species management hearing convened by the Ocean Policy Subcommittee of the Senate Committee on Commerce, Science and Transportation and which is included at appendix to this statement.

The Coalition was formed over four 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

While most understandable that this hearing today focuses on the invasive species challenges in the Great Lakes since it was this region that became one of the first documented victims of the significant damage which can be done by invasive species, I would like to broaden my testimony to address the absolutely critical need for a comprehensive national ballast water management strategy that will effectively address the invasive species issue associated with ballast water discharges, regardless of location. This need is based on the fundamental assumptions that (1) all of our precious marine ecosystems and resources need protection from this serious problem and (2) commercial shipping is an international business that requires international solutions to what is an international challenge. While it is an unfortunate fact that the wheels of international institutions may not turn as quickly as desired and thus admittedly the United States may not wish to wait for entry into force or accept an international solution, it is absolutely critical that a strong national program be crafted to ensure the appropriate level of environmental protection while at the same time providing regulatory certainty as to what is required of the thousands of vessels calling in US ports annually.

Almost twenty years ago, this issue was placed on the agenda of the International Maritime Organization (IMO). At the same time, concerns were beginning to be raised here in the United States relative to the impacts from invasive species being introduced via ballast water discharges. Since that time, IMO has concluded its ballast water treaty (February 2004), two federal statutes have been enacted (NISA 1990, NAISA 1996), numerous states have enacted their own programs, and significant resources have been directed to research and studies not only of the invasive species problem itself but also of possible solutions to the ballast water discharge component of the problem. And today, we have no less than five initiatives in Congress that have either resulted in or are intended to result in introduced legislation. Clearly, this issue has our attention and it is now time that we move forward to address this problem in a manner that protects our marine resources while at the same time continues to enable the efficient and economical transport of goods by water.

THE INDUSTRY'S POSITION

For almost ten years since the enactment of NAISA 1996, the industry has supported the creation of a mandatory national ballast water management program which initially allows for the use of ballast water exchange as well as other developing alternative management methods. While some vessels which carry relatively small quantities of ballast water can execute an exchange on a regular basis, many vessel types are unable to do so due to weather and/or stability issues which would jeopardize the safety of the ship and its crew and thus these alternative methods can provide an acceptable solution in this scenario. Additionally, the ecological effectiveness of exchange has been questioned for a variety of reasons and thus we, the industry, have been looking ahead to determine what technologies may be available to treat ballast water in an effective manner and thus eventually remove the need to exchange entirely from the regulatory framework once technology is developed to enable shipboard systems to meet the needed efficacy. The industry position has espoused four basis fundamental concepts since discussions on this issue started in the mid-1990s. First and as alluded to above, there is a need for a mandatory national ballast water program. Second, as part of this program, there is a need to create a ballast water management discharge standard that adequately reflects technological capabilities while yet providing the necessary incentives to improve the efficacy of these technologies over time. Third, a process needs to be created which will enable the creation of public-private partnerships which actually gets technologies onboard ships for real world testing – the so-called ballast water management testing and certification program. And finally, to enable a cohesive and comprehensive national program, the federal program must preempt individual states from creating their own programs which vary from the federal program and those created by their sister states. While I recognize that the issue of preemption is an emotional one anywhere but most especially at a field hearing, I would ask you to note that a number of state environmental agency representatives have publicly stated their desire for a strong federal program which would obviate the need for each state to divert precious human and financial resources to create their own programs.

I am happy to be able to say today, that but for the preemption issue, the IMO ballast water convention has, in fact, created international programs to address each of these issues. I am even happier to say today, that Senate Bill 363 as introduced by Senator Inouye and co-sponsored by Senators Akaka, Cantwell, Lautenberg, Sarbanes and

Stevens addresses each of these issues. While the industry still has some concerns with certain provisions of S 363, most specifically the ballast water performance standard, the bill as marked up and reported out of the Senate Commerce, Science and Transportation Committee on July 21, 2005 provides an excellent framework from which we can address these issues in a logical, environmentally and economically effective manner and yet compares favorably in most cases to the provisions of the IMO Convention which will thus facilitate the understanding and compliance of the global maritime fleet with US requirements. In addition, the provisions of this proposed legislation dovetail in a positive way with past, current and future initiatives of the US Coast Guard to implement the necessary regulations to move ballast water management from theory to real world application and implementation.

WHY A NATIONAL PROGRAM WHICH PREEMPTS STATE INITIATIVES?

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 vary with international requirements. Not without some pain, the industry has adjusted to these US 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. 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

BALLAST WATER TREATMENT TECHNOLOGIES

Worldwide, technology developers and ship owners/operators are engaged in a search for ballast water treatment technologies that will address this problem. Most recently this July, the IMO Marine Environment Protection Committee concluded its first technology review as required by the ballast water convention and although not conclusive, determined that a number of promising technologies were being tested world-wide. These technologies include, among others, physical separation, heat, ultraviolet and a number of biocides which have the potential to provide effective "kill" results in the ballast water system but yet have sufficiently short residence times to prevent negative impacts on the environment when the treated ballast water is discharged. Even more germane to this hearing acknowledging the regional concerns associated with NOBOB (no ballast on board) vessels, these treatment systems would effectively eliminate the threat of invasive species introductions associated with suspended and collected sediments in ballast water tanks since the organisms would be treated either before they entered or while they were contained in the ballast water tanks. Relative to technology development, there is one thing which I can safely say that all would agree. There is no silver bullet that will provide the necessary efficacy on all ships on all voyages in all water bodies. It is for this reason that we need to move forward now with the experimental shipboard technology testing programs outlined in the IMO Convention and already in place here in the US via an existing US Coast Guard Navigation and Inspection Circular. It is simply not good enough that technologies work in a laboratory or even in a pilot stage test bed. We must get them on ships and tested in the real world

operating environment of commercial shipping, which will allow us to take into account the varied operating environments, marine ecosystems and ship characteristics i.e. ballast water capacities and flow rates. The Chamber is pleased to note that three of our member companies are currently engaged in shipboard testing of three different technologies on three different type vessels trading to three distinctly different regions, the West Coast of the United States, the Gulf Coast of the United States and the Great Lakes/Northern Europe. While not completed, all of these technologies are showing significant promise in achieving the performance standards as contained in the IMO Convention, but not the two orders of magnitude more stringent standard contained in S 363.

ESTABLISHMENT OF A NATIONAL DISCHARGE STANDARD

Probably the most confounding aspect of this entire issue is the question of what is the appropriate national discharge standard for ballast water effluent. It must obviously be environmentally protective, but equal as obvious, it must also be technologically achievable, lest we be left with a legal requirement that is impossible to meet. Compounding the difficulty even further is the fact that the science of invasion biology is not sufficiently mature, at least from what I, a simple mariner, have been told by invasion biologists, to accurately predict which organisms in which concentrations will be a threat to a particular marine ecosystem and which ones will not. This conundrum has been wrestled with by scientists and policy makers worldwide with no certain answers identified. Thus, the IMO convention represents the world's consensus (although not the US's) of a good "starting" point which will significantly reduce the existing risk and establish a reasonable hard target to which shipowners and technology developers may aim. A number of discussions here in the US have debated the need for a "hard" numerical standard versus the creation of a Best Available Technology program by which the numerical standard would be established after a number of technology test results have been compiled. The industry strongly advocates for the creation of a "hard" numerical standard for one simple reason. The cost to install a prototype treatment system onboard a vessel and conduct the necessary scientifically valid tests has in the past and is expected in the future to reach or exceed one million US dollars. Without the existence of a numerical standard, this very expensive effort can be compared to a shot in a dark room with no target by someone with their eyes closed. Establishment of a numerical standard enables technology vendors to test out their prototype systems ashore and present the results to "sell" their system to a ship owner or operator which will then be more inclined to commit to a partnership with the technology developer to conduct the costly but necessary shipboard tests.

ENACTED BALLAST WATER LEGISLATION MUST BE THE EXCLUSIVE FEDERAL PROGRAM WHICH REGULATES BALLAST WATER MANAGEMENT AND DISCHARGES IN US WATERS

The industry strongly believes that enacted ballast water legislation should be the exclusive federal program which regulates ballast water management and discharges in US waters. As a result of a recent US 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 industry strongly supports congressional action to clear up this confusion and recommends the inclusion of appropriate text in any legislative initiative to

clearly manifest Congress's intent to regulate ballast water management under the provisions of ballast water specific legislation.

In conclusion, this is obviously not an easy problem to solve. But we, the industry believe that reasonable and environmentally protective solutions are within reach to significantly reduce the risk of aquatic invasive species invasions associated with ballast water discharges.

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

APPENDIX

STATEMENT FOR

THE OCEAN POLICY STUDY SUBCOMMITTEE

OF THE

SENATE COMMITTEE ON COMMERCE, SCIENCE

AND TRANSPORTATION

ON

WEDNESDAY, JUNE 15, 2005

AT

9:30 A.M. IN SR-253

PREPARED BY

MS. 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% of the vessels calling in US 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 four 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 COORINDATED FEDERAL PROGRM 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 US 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 US WATERS

The Coalition strongly believes that enacted ballast water legislation should be the exclusive federal program which regulates ballast water management and discharges in US waters. As a result of a recent US 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 please to answer any questions you may have.

Mrs. MILLER. Our next witness is James Weakley. Mr. Weakley became the president of the Lakes Carriers' Association on January 16, 2003. And in his capacity, he acts as the chief spokesman for the U.S.-Flag Great Lakes carriers, representing the industry on a variety of issues. He graduated from the U.S. Coast Guard Academy in 1984. And as an Engineering Officer, he traveled aboard the Coast Guard Cutter MIDGETT.

In 1993, he entered the private sector, joining the Interlake Steamship Co., where he served as personnel director and later as operations manager. He was recalled to active duty following the events of September 11th, and was thereafter awarded the Department of Transportation 9–11 Medal. He also has received several other medals, and serves on the boards of numerous marine associations.

Mr. Weakley, we appreciate your service to our Nation, and we appreciate your attendance here today, and look forward to your testimony, sir.

STATEMENT OF JAMES H.I. WEAKLEY, PRESIDENT, LAKE CARRIERS' ASSOCIATION

Mr. WEAKLEY. Thank you, Ma'am. Thank you, Madam Chairman.

Lake Carriers' Association deeply appreciates the opportunity to address what is undoubtedly the most important environmental issue currently facing the Great Lakes, invasive species. The industry and the Federal Government must work together tirelessly to find solution to this vexing problem, otherwise more nonindigenous species will be introduced into the Great Lakes via ballast water from ocean-going vessels.

Everyone involved in the Great Lakes shipping has an obligation to keep the Great Lakes open to commerce but closed to exotics. Lake Carriers' Association has been a leader in the efforts to end this invasion, and pledges to cooperate in the future in any way possible.

Our members annually move as much as 125 million tons just here on the Great Lakes. Iron for the steel production, coal for power generation, and limestone for construction are our primary commodities. The problem with aquatic invasive species must be solved so that waterborne commerce on the Great Lakes can remain the safest and most efficient way to move raw materials that drive the regions and our Nation's economies.

However, as a starting point, we must recognize that U.S. flag dry-bulk cargo vessels, commonly referred to as Lakers, operate exclusively within the Great Lakes and enclosed aquatic ecosystems. Therefore, Lakers have never introduced an invasive species to the Great Lakes. These invaders have been introduced via ballast water from the ocean-going vessels or Salties. Nonetheless, Lake Carriers' Association is committed to finding ways to stop future introductions.

In 1993, the Association became the first maritime organization in North America to institute voluntarily practices to slow the spread of invasives that have been introduced to the Great Lakes by ocean-going vessels.

LCA pioneered research on filtration and treatment of ballast water for possible application on Salties, and over time has developed additional ballast water management practices for its members to implement to lessen the spread of the established exotic species.

We must further note that there are significant design and operational differences between the Salties and the Lakers. Therefore, a system or a practice that is viable on an ocean-going vessel, may not be effective on a Great Lakes dry-bulk cargo vessel. A Saltie requires as much as 3 million gallons of ballast water when emptied of cargo, and loads or discharges at a relatively slow water. A Saltie can in fact be in port for days. The largest U.S.-Flag Lakers load or discharge cargo in a matter of hours, taking on as much as 15 million gallons of ballast. Simply put, a system that can treat 3 million gallons of ballast over 1 or more days on a Saltie, would be overwhelmed by the Laker's flow rate of 80,000 gallons per minute.

Therefore, I must reiterate that the only way to stop introductions of invasive species, is to develop a system or operating procedures that will remove or block nonindigenous species from the ballast water of ocean-going vessels. Since LCA's members do not operate ocean-going vessels, we defer to other operators to make specific recommendations for the new requirements for Salties.

However, the reality is that those nonindigenous species that have established themselves in the Great Lakes, are going to migrate throughout the system over time. There are no natural barriers separating the Great Lakes. Therefore, whatever measures are eventually required of Salties, would have little or no value on Lakers. Again, Lakers confine their operations exclusively to the enclosed aquatic ecosystem. Their ballast water contains only what is already in the Great Lakes.

LCA members have voluntarily implemented ballast water management practices to slow the spread, but no shipboard system or practice can eliminate exotics that have taken root in the Great Lakes. As a draft of port, the Great Lakes Regional Collaboration declares, "Once these invasions have been launched, they are irreversible."

The war against future introductions of nonindigenous species will be won or lost in the ballast tanks of ocean-going vessels.

Thank you, Madam, and members of the committee for this opportunity to appear before you. I'll be pleased to answer any questions you might have.

Mrs. MILLER. Thank you very much.

[The prepared statement of Mr. Weakly follows:]

Testimony
James H. I. Weakley
President - Lake Carriers' Association

House Committee on Government Reform
Subcommittee on Regulatory Affairs

HEARING
PROTECTING OUR GREAT LAKES:
BALLAST WATER AND THE IMPACT OF INVASIVE SPECIES

Anchor Bay High School
Fair Haven, Michigan
Friday, September 9, 2005

SUMMARY

U.S.-Flag Great Lakes dry-bulk cargo vessels (Lakers) operate exclusively within the Great Lakes, an enclosed aquatic ecosystem. Therefore, Lakers have never introduced an invasive species to the Great Lakes. These invaders have been introduced via the ballast water on ocean-going vessels (salties). Nonetheless, Lake Carriers' Association (LCA) is committed to finding ways to stop future introductions. In 1993, the Association became the first maritime organization in North America to institute voluntary practices to slow the spread of an invasive introduced to the Great Lakes by ocean-going vessels. LCA pioneered research on filtration and treatment of ballast water for possible application on salties and over time developed additional ballast water management practices for its member to implement to lessen the spread of established exotics.

The only way to stop future introductions of invasive species is to develop systems or operating procedures that will remove or block non-indigenous species from the ballast water on ocean-going vessels. Since LCA's members do not operate any ocean-going vessels, we defer to other operators to make specific recommendations for new requirements for their vessels. However, the reality is that those non-indigenous species that have established themselves in the Great Lakes are going to migrate throughout the system over time. There are no natural barriers separating the Great Lakes. Therefore, whatever measures are eventually required of salties would have no value on Lakers. Lakers confine their operations exclusively to the enclosed aquatic ecosystem; their ballast water only contains what is already in the Great Lakes. LCA's members voluntarily implemented ballast water management practices to slow the spread of those invasives that have been introduced by salties, but no shipboard system or practice can eliminate exotics that have taken root in the Great Lakes. As the Draft Report of the Great Lakes Regional Collaboration declares, once these invasions have been launched, they are "irreversible." The war against future introductions of non-indigenous species will be won or lost in the ballast tanks on ocean-going vessels.

Testimony
James H. I. Weakley, President - Lake Carriers' Association
House Committee on Government Reform, Subcommittee on Regulatory Affairs
Hearing: Protecting our Great Lakes: Ballast Water and the Impact of Invasive Species
Anchor Bay High School, Fair Haven, Michigan
Friday, September 9, 2005

FORMAL TESTIMONY

Thank you, Madame Chairman. Lake Carriers' Association deeply appreciates the opportunity to address what is undoubtedly the most important environmental issue currently facing the Great Lakes: Invasive Species. Industry and the Federal Government must work together tirelessly to find a solution to this vexing problem, otherwise additional non-indigenous species will be introduced to the Great Lakes via the ballast water on ocean-going vessels.

Lake Carriers' Association represents 12 American corporations that operate 55 U.S.-Flag vessels exclusively on the Great Lakes. These vessels annually carry as much as 125 million tons of dry-bulk cargo that drive the regional and national economies of both the United States and Canada. Iron ore for the steel production, coal for power generation, and limestone for construction are the primary commodities our members haul. So efficient is the U.S.-Flag Great Lakes fleet that a vessel can carry a ton of iron ore 800-plus miles for less than the price of a meal at a fast food restaurant.

Given that these vessels are confined to the Great Lakes, we can state with certainty that no LCA vessel has ever **introduced** a non-indigenous species to the Great Lakes. These vessels operate entirely within the enclosed aquatic ecosystem, so their ballast water only contains what is already in the Great Lakes. Nonetheless, Lake Carriers' Association is committed to the goal of eliminating ballast water on ocean-going vessels as a vector for introducing new exotics into the Great Lakes.

First to Try to Stem Expansion of Ruffe

The issue of ballast water introduction of non-indigenous species first gained widespread attention on the Great Lakes when the ruffe was discovered in Duluth/Superior harbor in the early 1980s.[1] Introduced by an ocean-going vessel (saltie), the fish multiplied so quickly it threatened to displace native aquatic species. Alarmed at the prospect of the ruffe colonizing other areas of the Great Lakes, Lake Carriers' Association mobilized the maritime community and developed *Voluntary Ballast Water Management Practices for the Control of Ruffe in Lake Superior Ports* in 1993. The effort was the first of its kind in North America and hailed by the U.S. Fish and Wildlife Service as being "the cutting edge of technology."

These *Practices* aimed not to eliminate the ruffe from Duluth/Superior harbor; the fish was by then firmly established; but rather, to slow its spread throughout the Great Lakes. Despite the fact that Duluth/Superior typically ships and receives more than 1,000 cargos a year, the *Practices* achieved their objective. Only two other colonies of ruffe have been identified outside Lake Superior, one in Alpena, Michigan, on Lake Huron, and the other in Escanaba, Michigan, on Lake Michigan.

[1] Duluth, Minnesota and Superior, Wisconsin, often referred to as the "Twin Ports."

The U.S. Fish and Wildlife Service confirmed the effectiveness of LCA's *Practices* in its report *Surveillance For Ruffe in the Great Lakes, 2004.* "Voluntary ballast exchange [when ballast was taken in Duluth/Superior harbor] conducted by the Lake Carriers' Association, educational efforts conducted by Sea Grant and state, tribal, and federal environmental organizations, and range monitoring documented by surveillance, have significantly reduced the potential of human assisted ruffe range expansion. It appears that ruffe are expanding their range very close to unassisted range expansion projections."

A Pioneer on Research

LCA next partnered with Northeast-Midwest Institute in 1996 to test filtration and ballast treatment systems that could be installed on ocean-going vessels. Equipment was installed and tested on a Canadian-Flag Laker and then transferred to a barge moored in Duluth/Superior harbor for further testing and analysis. The project determined that filtration, followed by a secondary treatment such as ultraviolet irradiation, could be a workable option, but more research must be done before any system is viable for use on ocean-going vessels.

Implement Practices Lakes Wide

Although it is ocean-going vessels that have introduced non-indigenous species to the Great Lakes, Lake Carriers' Association recognized its responsibility to help slow the spread of these exotics. Therefore, in 2001, the Association's members implemented *Voluntary Ballast Water Management Practices* with that expressed goal. The actions taken include:

- ⇒ Avoiding discharge or uptake of ballast water in areas within or that may directly affect marine sanctuaries, marine preserves or marine parks;
- ⇒ Cleaning ballast tanks regularly to remove sediments;
- ⇒ Rinsing anchors and anchor chains during raising to return organisms and sediments to their place of origin; and
- ⇒ If necessary, removing fouling organisms from hull or sea chests when in drydock.

What More Can Be Done?

Before addressing what should be the next steps in the war against invasive species, it is important to establish some facts about the Great Lakes and those exotics that have been introduced. First, the Great Lakes are an enclosed aquatic ecosystem. They are interconnected by the St. Marys, St. Clair, and Detroit Rivers and the Straits of Mackinac.[2] Therefore, there is no natural barrier to stop a non-indigenous species discharged in Lake Superior from migrating, admittedly over time, to the other Great Lakes. If an invasive finds the climate suitable and devoid of predators, it will flourish and migrate.

Second, U.S-Flag Lakers operate exclusively within the enclosed aquatic ecosystem, so their ballast water only contains what is already in the Great Lakes. Therefore, the solution to stopping future introductions is to find ways to ensure that the ballast water on ocean-going vessels no longer contains invasives. As the Draft Report of the Great Lakes Regional Collaboration declares, once these invasions have been launched, they are "irreversible."

Since Lake Carriers' Associations' members do not operate ocean-going vessels, we defer to other operators to make specific recommendations for new requirements for salties. We can only encourage continued and expedited research on systems and operating procedures and again stress that Lakers never leave the enclosed aquatic ecosystem, so they have never introduced a non-indigenous species to the Great Lakes. Therefore, there is no reason to even consider applying new requirements for salties to Lakers.

We must further note that there are significant design and operational differences between salties and Lakers, therefore a system or practice that is viable on an ocean-going vessel may not be effective on a Great Lakes dry-bulk cargo vessel. A saltie requires as much as 3 million gallons of ballast when empty of cargo, and loads or discharges cargo at a relatively slow rate — a saltie can be in port for days. The largest U.S.-Flag Lakers load or discharge cargo in a matter of hours, taking on as much as 15 million gallons of ballast. Simply put, a system that can treat 3 million gallons of ballast over one or more days on a saltie would be overwhelmed by the Laker's flow rate of 80,000/gallon per minute.

In summation, the only way to stop future introductions of invasive species is to develop systems or operating procedures that will remove or block non-indigenous species from the ballast water on ocean-going vessels. The war against future introductions of non-indigenous species will be won or lost in the ballast tanks on ocean-going vessels.

g:\weakley\speeches\050909-Michigan Ballast Hearing.doc

[2] In fact, Lakes Michigan and Huron are hydrographically considered one body of water.

Mrs. MILLER. Our next witness is Jason Dinsmore. Mr. Dinsmore serves as the resource policy assistant for the Michigan United Conservation Clubs [MUCC]; which has represented the views of millions of conservationists since 1937, with over 500 affiliated clubs whose mission is to conserve, protect, and enhance Michigan's natural resources and our outdoor heritage.

He serves as the expert in wildlife issues at MUCC, has a B.S. from Michigan State University in fisheries and wildlife. He's also pursuing his Masters in fisheries and wildlife, and has worked managing wildlife for the Department of Natural Resources and the Living Science Foundation.

He's an active member of the Great Lakes Fishery Trust's Scientific Advisory Team, as well as serving on several other State advisory boards.

We thank you for your presence here today, Mr. Dinsmore, and look forward to your testimony, sir.

STATEMENT OF JASON DINSMORE, POLICY SPECIALIST, MICHIGAN UNITED CONSERVATION CLUBS

Mr. DINSMORE. Thank you, Madam Chairman, and members of the committee.

Just as a quick illustration of how important this topic is to us, just yesterday I was reclining on a beach in Sutton's Bay in northern Michigan, and I got called back a little early from the vacation because no one else could cover the meeting here today. And it is very important to us, and very important to me as well. And my wife—it took a little convincing, but I made it here OK.

I guess I'll move forward just in the name of time here. Michigan United Conservation Clubs is a statewide conservation organization that has represented the views of millions of conservationists since 1937. As you mentioned, MUCC has over 500 affiliate clubs, with over 200,000 members, and 6,000 individual members, all united to insure conservation of Michigan's natural resources.

The members of MUCC, are people who understand the balance between economy and ecology. It's this understanding that makes us conservationists. A conservationist believes in the wise use of resources. We see the benefits of taking from nature for man's benefit and enjoyment, but we also respect and care for our resources, understanding that we if we take all of it or use it wastefully today, there will be nothing left for tomorrow or our next generations.

Michigan's hunters and anglers have been paying to protect, conserve, and keep Michigan's natural resources healthy and productive since the first hunting and fishing licenses were issued two decades ago.

There are a lot of issues that greatly concern Michigan's hunters and anglers. And at the top of this list is aquatic invasive species, or aquatic nuisance species depending on who you ask. Nothing's as frustrating as being told there's nothing that can be done about a problem that's invaded your home and begun to destroy the very resources you have been working your whole life to protect.

Surrounded by the Great Lakes, Michigan has ample opportunity to see the changes brought about by aquatic invasive species. A large chunk of Michigan's economy depends on healthy fishery. There are over 1 million anglers residing in Michigan, and over

353,000 people visit Michigan just to fish. These anglers contribute over $830 million to Michigan's economy when you add up the license fees, hotel rooms, fishing equipment, boat rentals and, purchases, food and drinks, gas and so on. Think of all the jobs these services provide. And the very base of many of these expenditures is a healthy Great Lakes fishery.

MUCC is grateful for the opportunity to be here today, and we are even more grateful that Congressman Miller has called us here. We have been waiting for someone to take a corrective approach at the Federal level, and I'm glad to see Michigan's own Congressman taking on that role. This hearing is an example of the forward thinking and motivated behavior that is necessary if we are going to protect the Great Lakes from further invasion.

In addition to that, we would ask Congressman Miller to consider the following suggestions: We need strong leadership in Congress to seek out and collaborate with Canadian leaders and international people, as was mentioned before, on this issue, especially in dealing with ballast water controls. Ultimately fixing the problem in the United States means nothing if the invasives can still enter through Canada or other national means.

We would urge Congressman Miller to fill this critical and often overlooked role, by supporting a reference from the U.S. Government to the International Joint Commission, asking them to address the needs for coordination and harmonization for invasive species prevention and control.

Also, insure that the Coast Guard's voluntarily best management practices [BMP's], program for NOBOBs becomes mandatory and fully enforced as soon as possible.

We would also ask that you please take the lead in advancing recommendations to the Great Lakes Regional Collaborative, including their recommendation that the government may not be able to implement mandatory ballast standards/technology by 2011. We need to have a backup plan in case this occurs. We would ask Congressman Miller to take on this role by calling for the study and development for a transshipment study of the Great Lakes, which would help keep out ocean-going ships and the invasives that carry ballast water—they carry if ballast water technology fails to be feasible in a timely solution.

Development of transshipment study would be the first time this type of innovative thinking would enter the political fray and maybe a solution not only to preventing introduction of invasive species but to a beleaguered economy. Can we translate the transfer of goods from ocean-going vessels into trains and lake carriers into jobs and economic growth within the region? We believe so.

Finally, Congress and the administration failed to move in a timely manner. We would ask that you help the other Great Lakes States move forward with legislation as similar or stronger to that which Michigan has done, to stop the spread of invasive species via ballast water. We would also ask that you fight to protect the ability of the Great Lakes States to enact its own regulations, stronger than those of the Federal Government, which may be lacking.

The problems and challenges caused by invasive species have increased over the years as the Great Lakes region takes its place in this world's ever expanding global economy. We are likely to see

more imports and exports from around the globe in the future, not less. And the transport of these goods leads to the greater threat of invasive species being imported along with lumber, textiles, and other goods.

Michigan's conservationists want to see a booming economy. We want to see the Great Lakes prospering and thrive. They are the backbone that support our way of life and our livelihoods. But in order for the Great Lakes to thrive, we need to prevent the spread of new invasive species.

I see my time is up, so I'll end it there. Once again, any questions.

Mrs. MILLER. Thank you very much. I appreciate that.

[The prepared statement of Mr. Dinsmore follows:]

Michigan United Conservation Clubs
2101 Wood Street
Lansing, MI 48912

September 9, 2005

Subcommittee on Regulatory Affairs of the House Committee on Government Reform
Field Hearing: "Protecting our Great Lakes: Ballast Water and the Impact of Invasive Species"

Michigan United Conservation Clubs is a statewide conservation organization that has represented the views of million of conservationists since 1937. MUCC has 458 affiliated clubs with over 200,000 members and 60,000 individual members all united to ensure conservation of Michigan's natural resources.

The members of Michigan United Conservation Clubs are people who understand the balance between economy and ecology. That is the reason we are conservationists and not preservationists. A conservationist believes in the wise use of resources. We see the benefits of taking from nature for man's benefit and enjoyment, but we respect and care for our resources, understanding that if we take it all or use it wastefully today there will be nothing left for tomorrow. And Michigan's hunters and anglers have been paying to protect, conserve and keep Michigan's natural resources healthy and productive since the first hunting and fishing licenses were issued.

There are a lot of issues that raise the concern and ire of Michigan's hunters and anglers- the state's conservationists- and at the top of their list is aquatic invasive species. Nothing is as frustrating as being told there is nothing that can be done about a problem that has invaded your home and begun to destroy the very resources you have been working your whole life to protect.

Experts and scientists have said there is nothing we can do about most of the aquatic invasive species within the Great Lakes ecosystem except try to manage them as best we can. Over 160 invasive species have entered the Great Lakes since the opening of the St. Lawrence Seaway in 1959, with control costs estimated at $137 billion per year. Seventy-seven percent of these new organisms are attributed to ballast water discharge.

Aquatic invasive species in the Great Lakes have led to some severe and irreversible consequences. Zebra mussels and other miniscule invasives are working to destroy the foundation of the Great Lakes food web- a tiny shrimp called *diporeia*. Sea lamprey caused the collapse of the lake trout fisheries in the 1940s and 50s. The round goby is competing with native fish for food. All of these pressures and more have begun to change the ecology of the Great Lakes. Fish species that once thrived are declining. They can not stand much more pressure and we must work quickly to keep new intruders from entering our Great Lakes.

Surrounded by the Great Lakes, Michigan has ample opportunity to see the changes brought about by aquatic invasives. A large chunk of Michigan's economy depends on a healthy fishery. There are over 1 million anglers residing in Michigan and over 352 thousand people visit Michigan just to fish. These anglers contribute over $830 million dollars to Michigan's economy when you add up license fees, hotel rooms, fishing equipment, boat rentals and purchases, food and drinks, gas, etc. Think of all the jobs these services provide. And the very bases of many of these expenditures is a healthy Great Lakes fishery.

With so much at stake, Michigan's legislature took a brave step forward this year and enacted some tough regulations to help prevent the introduction of new aquatic invasives. Michigan is the only Great Lakes state to have implemented laws that help regulate ballast water in order to protect the Lakes from the threat of invasive species. Bi-partisan legislation was passed in June of 2005 that looks to protect Michigan's waters from the threats of invasive species. It defines invasive species in ballast water as pollution and therefore, subject to regulation by the state. It requires ocean-going vessels stopping in Michigan's ports to get a permit from the Department of Environmental Quality and to treat ballast water to kill invasive species. The legislation also authorizes the creation of a multi-state Great Lakes Aquatic Nuisance Species Coalition, which will help achieve coordination among the Great Lakes states on measures to prevent and manage invasive species.

By doing this Michigan places itself is a sticky situation. The state is working to protect its borders and waters and serve as an example for the other Great Lakes states and Canadian provinces, but by placing theses restrictions on itself, it also opens itself up to losing business from the shipping industry. Why should ships stop in Michigan and deal with all our regulations when they could stop in any of the other Great Lakes states without the red tape? The other Great Lakes states and provinces must take responsibility for reducing the threat of invasive species as well. We need legislation that keeps new invasive species out of the entire Great Lakes Basin.

MUCC is grateful for the opportunity to be here today and we are even more grateful that Congresswoman Miller has called this hearing. We have been waiting for someone to take a proactive approach at the federal level and are glad to see Michigan's own Congresswoman take on that role. This hearing is an example of the forward thinking and motivated behavior that is necessary if we are going to protect the Great Lakes from further invasion.

We would ask Congresswoman Miller to consider the following suggestions:

- We need strong leadership from Congress to seek out and collaborate with Canadian leaders on this issue, especially in dealing with ballast water controls. Ultimately, fixing the problem in the United States means nothing, if invasives can still enter in Canada. We would urge Congresswoman Miller to fill this critical, often overlooked role by supporting a reference from the United States government to the International Joint Commission, asking them to address the

need for coordination and harmonization of invasive species prevention and control.

- To ensure that the Coast Guard's voluntary Best Management Practices (BMP's) program for NOBOBs becomes mandatory and fully enforced as soon as possible.

- We would ask Congresswoman Miller to please take the lead in advancing the recommendations of the Great Lakes Regional Collaborative including:
  - Enacting comprehensive federal legislation that contains all the provisions we see in S. 770. S.770 addresses many of the holes that currently exist, not just in regulating ballast water, but in closing many of the other loop holes that serve as pathways for invasive species. We need reasonable and necessary timelines like the ones outlined in this legislation which are important when fighting this uphill battle.
  - The Great Lakes Regional Collaborative recognized that the government may not be able to implement mandatory ballast standards/technology by 2011. We need to have a back-up plan in case this occurs. We would ask Congresswoman Miller to take on this role by calling for the study and development of a trans-shipment study for the Great Lakes, which would keep out the ocean-going ships and the invasives they carry if ballast water technology fails to be a feasible, timely solution. Development of a trans-shipment study would be the first time this type of innovative thinking would enter the political fray and may be a solution, not only to preventing introduction of invasive species, but to a beleaguered economy. Can we translate the transfer of goods from oceangoing vessels onto trains and lake carriers into jobs and economic growth within the region?

- Finally, if Congress and the administration fail to move in a timely manner, we would ask Congresswoman Miller to help the other Great Lakes states move forward with legislation, as similar to or stronger than what Michigan has done to stop the spread of invasive species via ballast water. We would also ask that she fight to protect the ability of the Great Lakes states to enact their own regulations, stronger than those of the federal government.

The first step toward the control and management of invasive species is stemming the flow of new arrivals. Congresswoman Candice Miller must lead the way in taking an active interest and approach to stemming the tide of invasive species entering the Great Lakes. It is leadership and direction of the type that has called this hearing that will be required if we are to make a difference and keep the ecosystem of the Great Lakes from being further degraded.

The problems and challenges caused by invasive species have increased over the years as the Great Lakes region takes its place in the world's ever expanding global economy. We are likely to see more imports and exports from around the globe in the future, not less, and the transport of these goods leads to the greater threat of invasive species being imported along with lumber, textiles and other goods. Michigan's conservationists want

to see a booming economy. We want to see the Great Lakes prosper and thrive- they are the very backbone that supports our way of life and our livelihoods, but in order for the Lakes to thrive we need to prevent the spread of new invasive species.

Mrs. MILLER. And our final distinguished panelist is Kurt Brauer. He is with the Michigan Council of Trout Unlimited. Mr. Brauer currently serves as the Chair of the Natural Resources Management and Conservation Advocacy Committee within that organization. He is the past president of the Paul H. Young Chapter of Trout Unlimited in Troy, MI.

And the Michigan Council of Trout Unlimited has 24 local chapters, and over 7,500 individual members. And there are over 140,000 members of Trout Unlimited across our great Nation.

Mr. Brauer, we look forward to your testimony.

STATEMENT OF KURT BRAUER, CHAIR, NATURAL RESOURCES COMMITTEE, MICHIGAN COUNCIL OF TROUT UNLIMITED

Mr. BRAUER. Madam Chair, members of the subcommittee, I appreciate the opportunity to speak to you today on behalf of myself and our 140,000 members of Trout Unlimited nationwide.

I'd also point out that since Trout Unlimited was established in the great State of Michigan in 1959, it has worked diligently to conserve, protect, and restore native and naturalized populations of trout and salmon and the waterbeds upon which these economically important and beautiful sport fish depend.

I always approach the topic of invasive species with some trepidation. This is because two of the four trout species that many of our members pursue and attempt to conserve, are actually introduced species themselves. Those would be the brown trout and the rainbow trout, which were introduced in Michigan at the end of the 19th century from Europe and the Pacific Northwest respectively, in an effort by early conservation officials to establish sport fisheries in heavily degraded environments.

There are other known exotics have acclimated themselves to and impacted our region. Infamous new residents such as the sea lamprey, the zebra mussel, and the Asian Big Head Carp are far but a few. Sometimes referred to as nuisance aquatic species, our organization prefers a more descriptive term, biological pollutants, as I think Attorney General Cox referred to them.

The aquatic ecosystems of our region are heavily impacted systems, which can and should be actively managed to achieve a variety of recreational, economic, and societal goals. And this is where the challenge with biological pollutants comes in. Once in the system, they are virtually impossible to eradicate. Unlike with toxins and non-living pollutants, once you control the source of those, you achieve a cleanup, and they don't reproduce themselves. With these living biological pollutants, even if you clean up 95 percent of them, they grow back, and you accomplish nothing in the meantime.

This means that the only appropriate and effective management strategy for biological pollutants, is to control their vectors of introduction and transport. The Michigan Council of Trout Unlimited has two policy positions related to this issue. The first: the Michigan Council of Trout Unlimited supports the passage of legislation to prevent the importation of exotic species in ship ballast water as well as by other means.

The second falls under the heading of cold water habitat restoration and may be a little bit less obvious. Our second policy consideration is that the Michigan Council of Trout Unlimited supports

the modification and removal of damns as part of a comprehensive river restoration effort.

The Michigan Council does not support the removal of the first barriers to fish passage upstream from the Great Lakes. And in part, that is to keep out some of the invasive species, such as the sea lamprey.

But these policy positions are pragmatic, particularly in regards to damns. Damns do very bad things to rivers, to the hydrology, to the thermal regimes, and they—but they also effectively protect our streams from many of the undesirable biological pollutants that currently reside in the Great Lakes.

On the national level, Trout Unlimited is actively involved in issues related to the management of undesirable exotic aquatic species. As a side note, it might surprise you to learn that the lake trout, which is an important native species of the Great Lakes region and which was almost eradicated by an invasive species, the sea lamprey, is actually an introduced exotic species in Yellowstone Lake, and threatens the survival of the native Yellowstone Cutthroat Trout. This puts Trout Unlimited in the unique position of advocating for the restoration in one location, and the eradication in another location of the same species of fish. So it's a national view on the basic species within our country, as opposed to invasive species coming from other countries, the Caspian Sea.

Trout Unlimited's national policy related to exotic aquatic species is as follows: the objective is to prevent and minimize the harmful impacts of nuisance invasive species on salmonids. Programs and projects include eradication of selected non-native western trout to restore native trout, and reducing the impact of whirling disease on native and wild trout.

That sums up my comments, and I'd be happy to answer any questions.

[The prepared statement of Mr. Brauer follows:]

Testimony of Kurt Brauer
On behalf of
Trout Unlimited and the
The Michigan Council of Trout Unlimited

Good afternoon. My name is Kurt Brauer, and I am the Chair of the Natural Resources Management and Conservation Advocacy Committee of the Michigan Council of Trout Unlimited. I am testifying today on behalf of the Michigan Council's 24 local chapters and over 7,500 individual members, as well as the over 140,000 members of Trout Unlimited from across the Nation. Since 1959, Trout Unlimited has worked to conserve, protect, and restore native and naturalized populations of Trout and Salmon, and the watersheds upon which these economically important and beautiful sport fish depend.

I always approach the topic of exotic, invasive species with some trepidation. This is because two of the four Trout species prevalent in Michigan today are introduced aquatic exotic species, and many of the members of our organization have an inordinate affection for them. The Brown Trout and the Rainbow Trout were introduced to Michigan at the end of the 19th Century from Europe and the Pacific Northwest respectively in an effort by early conservation officials to establish sport fisheries in heavily degraded environments.

There are other well know exotics which have acclimated themselves to and impacted our region. Infamous new residents such as the sea lamprey, the zebra mussel, and the Asian Big Head Carp. Sometimes referred to as Nuisance Aquatic Species, our organization prefers a more descriptive term, biological pollutants.

The important part of this introduction is to recognize that while many adjectives such as beautiful, productive, and even regenerative can accurately be applied to the aquatic ecosystems of the Great Lakes, there are other adjectives which are applied on a regular basis, such as pristine, which while compelling, are simply inaccurate and misleading.

The aquatic ecosystems of our region are heavily impacted systems which can and should be actively managed to achieve a variety of recreational, economic, and societal goals, and this is where the challenge with biological pollutants comes in. Once in the system, they are almost impossible to manage.

With toxics and other non-living pollutants, once your control their source, there is a real ability to remove them from or encapsulate them in the environment. While sometimes expensive, a 95% or greater "clean-up" is possible. Clean up 95% percent of a biological pollutant and they grow back, you accomplish nothing.

This means that the only appropriate and effective management strategy for these biological pollutants is to control their vectors of introduction and transport. The Michigan Council of Trout Unlimited has two policy positions related to this issue. The first is:

Exotic Species: The Michigan Council of Trout Unlimited supports passage of legislation to prevent the importation of exotic species in ship ballast water and other means.

The second falls under the heading of coldwater habitat restoration may be initially a little less obvious:

MCTU supports the modification and removal of dams as part of a comprehensive river restoration effort however; MCTU does not support the removal of the first barrier to fish passage upstream from the Great Lakes.
This policy position is actually very pragmatic in that while dams do very bad things to the hydrology and thermal regimes of streams, they very effectively protect our streams from many of the undesirable biological pollutants currently resident in the Great Lakes.

On the National level, or parent organization is actively involved in issues related to the management of undesirable exotic aquatic species. As a side note, it may surprise you to learn that the Lake Trout, an important native species of the Great Lakes region, while almost eradicated here by the Sea Lamprey, is an introduced exotic in Yellowstone Lake which threatens the survival of the native Yellowstone Cutthroat Trout. This puts Trout Unlimited in the unique position of advocating for the restoration in one location and the eradication in another location of the same species of fish.

Trout Unlimited's national policy related to exotic invasive aquatic species is as follows:

> **Invasive Species Management** (Tier 1)
> **Objective**: Prevent and minimize harmful impacts of nuisance invasive species on salmonids. Programs and projects include eradication of selected nonnative western trout to restore native trout, and reducing the impacts of whirling disease on native and wild trout.

Thank you for your time and attention. I would be happy to answer any questions.

Mrs. MILLER. All right. Thank you very much.

And we're going to—I'm certainly going to keep my questions to a bare minimum here in the interest of time. I should say my colleagues have to catch a flight tonight, and we know what traffic is like on I–94, so we're going to wrap this up in about 10 minutes here.

But I might ask generally, I guess of the panel. I notice there was quite a bit of difference between Attorney General Cox's comments about whether the EPA or Coast Guard should be the lead agency for compliance, as well as quite a bit of difference of opinion between some of the panel now and the previous panel about the Senate bill 363.

And I think Mr. Schornack mentioned that he thought the Coast Guard, not the EPA, should be the agency regulating ballast water. I guess I'm just trying to get a sense of everyone's feeling there. Should it be the Coast Guard or the EPA?

Do you want to start with that, Mr. Schornack?

Mr. SCHORNACK. I'd be pleased to start there.

Chair Miller, Congress has already spoken to the lead agency and what act is to be employed in the regulation of invasive species or in the case of ships' ballast water, and that's—they've chosen the Coast Guard. And the Coast Guard has ample authority to board ships. Foreign vessel captains are familiar with them.

We have case—if they were only to get off the dime. I think the real problem here is time and that is moving too slowly. I think you heard Commander Moore speak very articulately to the scientific aspects of the regulation of ballast water, along with Mr. Brandt from NOAA. They've been working very closely together. And the Coast Guard is the right agency. They deal with ships.

The EPA has very little experience with ships. They've been reluctant to engage in the business of regulating ballast water. It even took a judge in San Francisco to basically say that the Clean Water Act applied. And the very programs under the Clean Water Act are not designed to fix—in terms of the NPDES program, the Pollutant Discharge Elimination System, that's designed to deal with a given waterway with total loadings of chemical pollutants to a given waterway. And it deals with fixed sources, not mobile sources.

It's also delegated to all of the States, including all of the—or, delegated to States, including all of the eight Great Lakes States have delegated authority. That means, as Kathy Metcalf pointed out, that you could end up with a patchwork quilt of regulations that would make it very difficult to achieve the goal of closing the door to invasives, but keeping them open to commerce, because the ships would not be able to meet all of these varying requirements. And with that, I really think that.

And there's also the prospect of delays in terms of litigation under the Clean Water Act. I think there have been problems with litigation. That's how we wound up with this judge in the first place deciding that the Clean Water Act should be employed.

But I think a good, strong message to the Coast Guard, putting a single agency in charge, one that's familiar with this problem, is the right way to go.

Mrs. MILLER. OK.

Ms. METCALF. In the interest of I–94, I'll second it, with—to Mr. Schornack's comments. I'll second what he said, with this specific comment: absolutely the Coast Guard should be the lead agency. I would question whether or not S. 363 really prohibits the EPA from participating. What I would suggest is that it charges the Coast Guard with creating and implementing the standard. And I would hope most certainly, and I know my organization—and I'll leave it to Mr. Weakley to refer to his position on this—is we would expect the EPA to be consulted on this, most definitely, because that is where the expertise is in the Federal Government for establishing environmental standards. But that is not where the expertise is in regulating ships.

The other point I would make, is that there is a need, as Commander Moore said, for the standard to be set in a legislation. If you think it's been slow thus far, it's going to be just as slow because NEPA, from what I'm told by the agencies, creates a more time-consuming process for a new standard to be created than would be the case if the standard was included in the legislation.

Mrs. MILLER. Thank you.

Mr. Weakley.

Mr. WEAKLEY. Panel, I would certainly echo the comments that preceded mine. I would add to that the matter of practicality and enforcement regime, as someone that's been an inspector for the Coast Guard, and also someone that's been inspected as a vessel operator, the Coast Guard is trained in inspecting vessels. They go on to enforce a myriad of—in fact, we'll tell you it's for all applicable U.S. laws. It's one-stop shopping. I think it's a far more efficient system than what we'd incur under an EPA and PDS permit process. So I think that from enforceability and visibility, I think the Coast Guard is the more practical agency to be the lead.

Mrs. MILLER. Thank you. Do the other two have an opinion on that particular question.

Mr. DINSMORE. Madam Chair, I know enough to know—to say when I don't know. We don't have a policy per se on who should be the regulatory authority, the EPA or the Coast Guard. Our concerns are mainly—when I say our, I'm referring to MUCC, are mainly with regard to enforcement of regulations. Regardless of who the regulatory body is or may be, we would like to see those regulations enforced to the fullest extent. That's our main concern here.

Mrs. MILLER. Thank you.

Mr. BRAUER. Madam Chair, the Michigan Council of Trout Unlimited does not have a policy with respect to the specific question. I will say that from my own belief, the Coast Guard is best suited to enforce the regulations, and perhaps the EPA is best suited to help them establish the standards under which ballast water can be regulated.

Mrs. MILLER. Thank you, thank you.

Member Lynch.

Mr. LYNCH. Thank you, Madam Chair, I just have one question.

Mr. Schornack, in your testimony, it's on page 3, you say that the United States wants the ballast—the standard. The discharge standard that the IMO adopted is weaker than what the United States wanted and has been questioned by many experts as not

being fully protective of the Great Lakes. I wonder if you could just sort of give me the delta. What's the difference between what is our ideal, and what was actually adopted?

Mr. SCHORNACK. Well, sure, I can.

Mr. LYNCH. Thank you.

Mr. SCHORNACK. The Coast Guard was of course—which has been the lead agency in charge of this issue for over 15 years, was chosen by the President to lead the American delegation to the International Maritime Organization Conference last year. Of course, that's a branch of the United Nations. And there are many, many countries involved.

But the standards that the United States took to that convention, was 100 fold—100 times tougher in terms of the numbers of creatures per volume of water. If it was 100—just using an example, without—I can't pull the numbers right out of my head here. But let's say it was 100 for—the IMO was 100, it was 10 times less for the United States.

So in the end, the negotiated standard at the conference was in fact watered down. And I'm not an expert enough to say that the standard achieved in the IMO convention was—is not protective at all, but I have heard experts say that they're very disappointed with the IMO standard. They do not feel that it is much more protective than ballast water exchange, which is what we have today.

Mr. LYNCH. OK. Well, thank you. That's helpful.

I yield back.

Mrs. MILLER. Representative Westmoreland.

Mr. WESTMORELAND. Thank you, Madam.

Let me just make a comment about the EPA versus the Coast Guard. The EPA's position, and I'm not speaking for them, but I can just imagine that theirs would only be on the cleanliness of the water and have nothing to do with any kind of organism or anything else coming in the water. In fact, you might find yourself protecting these species over here if you get the EPA involved in that.

Mr. Dinsmore, one question. In your written statement that you submitted, you had that there's an annual cost of $137 billion. Is that a misprint? Is that supposed to be million, or is that truly billion dollars?

Mr. DINSMORE. I'm looking for that right now.

Mr. WESTMORELAND. It's on the first page.

Mr. DINSMORE. I don't have that here in front of me. I'm trying to find that right now. The statement that we have, the official statement that was printed out and given copies to the representatives or to the committee, was not developed by me. It was developed by our associate. And I don't have that here in front of me unfortunately.

I do know that—was that in regard to the zebra mussel period, or the invasive species as a whole? I know the national total is in the millions.

Mr. WESTMORELAND. It just says over 160 invasive species have entered the Great Lakes ever since the opening of the St. Lawrence Seaway in 1959, with control costs estimated at $137 billion per year.

Mr. DINSMORE. I can say I've heard that number tossed out before. I can't say that specific one, unfortunately, because I did not draft those comments there in front of you.

I do know that the control costs that are being figured, are not direct costs borne by the persons whose control that zebra mussel or whatever it may be that has the problem right there in front of them. It's the overall costs, costs from loss of activity, costs in direct control, indirect costs that are borne by the manufacturer or the industry as a whole. They do total into the billions at that point. I'm not sure of the exact figure unfortunately for you.

Mr. WESTMORELAND. Let's deal with this $137 million, it's still——

Mr. DINSMORE. It's still a large number, yes.

Mr. WESTMORELAND. It's still a lot of money. And I'm just wondering how much of that would be local funds, and how much of it is either State or Federal funds? I don't suppose you would know that either, would you.

Mr. DINSMORE. I know a lot—well, in my short bio that was provided to you, which I heard for the first time now as well. I didn't—before coming here, I didn't see——

Mr. WESTMORELAND. That's OK.

Mr. DINSMORE. Until just recently, I sit on the Scientific Advisory for the Great Lakes Fishery's Trust. And I know that as a trust we dedicate or have dedicated millions of dollars toward research in regards to invasive species. So that's one of those. You know, I'm sure there's a nonprofit one there as well. Anglers of Michigan don't do—dedicate quite a bit of their license fees toward research and other control measures. I didn't see if anybody mentioned before that type of program. I don't know the exact breakdown, but I do know that it's a collaborative effort between both State, Federal, and non-profit realms.

Mr. WESTMORELAND. And one last question. Mrs. Metcalf, I hope you can answer this. When you were taking in ballast water or putting out ballast water, does it use the same port for taking it in as putting it out? Does it have an intake and outtake, or does it just have one that serves as both.

Ms. METCALF. Generally it can—depending on ship type, but generally it's the same inlet and outlet. However, when a ship conducts an exchange, particularly if it's of a type known as flow through or dilution, the ballast water may actually come in through the sea chest and below the water line, but exit through the tank top as it's being pushed out of the tank by the sea water coming in.

But relative to that, back to treatment technologies, because most ballast water does traverse through common piping from a common inlet and outlet, that's why we want to hit the treatment right there at that point.

Mr. WESTMORELAND. Good. And I was thinking, you know, a backwash type situation. If you had an inlet and an outlet, you know, you could hook something up and continually backwash it without, you know, actually draining it. I mean, you would have a source to get it into a filtering system or something without putting it back into the water.

Ms. METCALF. Right. Yes, sir. In fact, a number of the treatment systems that are being tested on board right now have an applicator. You don't even have to go through a loop. You've got a certain application rate for, for instance, ultraviolet or heat or physical separation that allows us—hopefully will allow us, even on the larger ships, to hit the ballast water as it's moving past into the tanks.

Mr. WESTMORELAND. Thank you, ma'am.

No further questions, Madam Chair.

Mrs. MILLER. All right. Thank you very much.

I certainly want to thank again our witnesses. It's been very, very enlightening. And if any of the committee members have further questions, we'll submit them to you, and perhaps your could answer them for us, and we would put them in the record. I want to be very helpful.

I want to again thank our gracious host, and the hospitality that's been offered to the subcommittee by the Anchor Bay High School and Anchor Bay School District, and Principal Stefanac as well, and all of the students. So we certainly appreciate the attendance today.

And with that, I will call the meeting in adjournment.

Thank you very, very much.

[Whereupon, at 4:37 p.m., the subcommittee was adjourned.]

○