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H.R. 4650, THE NATIONAL LEVEE SAFETY PROGRAM ACT

(109–65)

HEARING

BEFORE THE

SUBCOMMITTEE ON
WATER RESOURCES AND ENVIRONMENT

OF THE

COMMITTEE ON
TRANSPORTATION AND
INFRASTRUCTURE
HOUSE OF REPRESENTATIVES

ONE HUNDRED NINTH CONGRESS

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H.R. 4650, THE NATIONAL LEVEE SAFETY PROGRAM ACT

Thursday, April 6, 2006,

HOUSE OF REPRESENTATIVES, COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE, SUBCOMMITTEE ON WATER RESOURCES AND ENVIRONMENT, WASHINGTON, D.C.

The committee met, pursuant to call, at 10:00 a.m., in Room 2167, Rayburn House Office Building, Hon. John J. Duncan, Jr. [chairman of the committee] presiding.

Mr. DUNCAN. I am going to go ahead and call this hearing to order. This is a hearing on H.R. 4650, The National Levee Safety Program Act of 2005.

I would like to welcome everyone to the hearing today. I was very pleased that prior to the end of the first session of the 109th Congress, Subcommittee Ranking Member Eddie Bernice Johnson, Chairman Don Young, Ranking Member Jim Oberstar and I introduced H.R. 4650, The National Levee Safety Program Act. We have seen in the Gulf Region what can happen when hurricane and flood protection infrastructure is inadequate or fails to perform. Yet more Americans are moving to coastal areas where the risk of hurricanes and floods is greatest. In the south Atlanta region, the coastal population grew 51 percent from 1980 to 2000, and is expected to increase another 13 percent by 2008. Along the Gulf of Mexico, the population has also grown dramatically, and is projected to grow an additional 12 percent just by 2008.

We do not know where the next hurricane or flood will hit, but we do know that many of our major cities, including parts of Washington, D.C., have a greater probability of flooding than did New Orleans. For example, the City of Sacramento, California, has almost twice as many people as New Orleans, yet it has less flood protection than any other major city in America. Cities like Houston, St. Louis and Miami also are at risk. We cannot treat citiesdifferently unless we have a policy reason that we can explain and justify to our constituents.

As we have learned from recent levee failures, our infrastructure is aging. What we know about the existence and condition of these other levees we often learn when one fails or is overwhelmed by a flood event. For instance, the State of California recently declared a state of emergency in the central valley in anticipation of the failure of 24 levees. According to the State of California, it would cost $5 billion to make critical delta levees, not all delta levees, but simply the critical ones, stronger in the face of flood and seismic events in the central valley.

In the past, this Committee has taken steps to ensure that the Nation's flood damage reduction infrastructure is properly inventoried, inspected and assessed. In 1986, the Congress authorized the National Dam Safety Program Act to conduct an inventory and assessment of all dams nationwide. This has been a successful program and we have modeled the National Levee Safety Program Act after that law.

The national inventory of dams shows that 45 percent of all Federal dams are at least 50 years old and that 80 percent of them are at least 30 years old. We know less about the status and capabilities of our levees. There has never been a national inventory of levees. Little is known about the current condition of both Federal and non-Federal levees, including whether these levees were designed to meet current conditions or whether they have been properly maintained by the non-Federal interests.

Over the decades, levees have been built by different entities at different times and to different standards. They have been linked together to provide a protective system, but with such a mixture of conditions the true level of protection may be in doubt. Over time, development has taken place behind some of these levees so that much more may be at risk in terms of lives and economic resources.

There is so much that we do not know about the levees in America that we cannot be sure how safe our cities and towns really are. We need more information. That is why we have introduced the National Levee Safety Program Act, to get an inventory of levees in the United States and work with the States to encourage them to develop their own levee safety programs.

We have worked closely with members on both sides of the aisle and the various groups to advance the goal of improving the infrastructure in the most cost effective manner. We have received favorable feedback from diverse parties. The National Levee Safety Program Act embraces innovative solutions for the inventory and subsequent assessments of these structures.

H.R. 4650 includes provisions for the Army Corps of Engineers to conduct an inventory, inspections and assessments of all levees nationwide. The legislation establishes an interagency committee on levee safety to create standards for Federal levees and creates a National Levee Safety Review Board made up of Federal, State, local and private citizens to monitor levee safety and implementation of State levee safety programs.

The bill also provides incentives for States and localities to participate in the program.

In order to make the best investment of taxpayer dollars, we need to do an inventory and inspection and assessment of levees across the United States. We need to know what they are protecting and what is the level of risk associated with these levees. This should help us prioritize future spending on flood protection. I hope that our witnesses today will help us understand the current condition of our hurricane and flood protection infrastructure and what it should look like in the future.

I hope to hear some suggestions on how this good legislation can be made better. I look forward to an educational and enlightening hearing.

Let me now turn to my good friend, the Ranking Member, Mr. Johnson, for any opening statement she wishes to make.

Ms. JOHNSON. Thank you very much, Mr. Chairman, for holding the hearing today on an issue that is of tremendous to our communities: the condition of our Nation's flood control infrastructure.

In the aftermath of the 2005 hurricane season, the American public has again focused on the importance of adequately designed, constructed and maintained flood control infrastructure and protecting lives and livelihoods. The image of flooding streets, homes and businesses, as well as the thousands of displaced families, have again brought home the message that we cannot take our Nation's infrastructure for granted. The consequence of failure is far too great.

In the weeks and months that followed Hurricanes Katrina and Rita, numerous communities throughout the Country started asking questions about their own disaster response plan, including their potential vulnerability to flooding. Unfortunately, one lesson learned from this exercise was that no single entity could quantify the Nation's risk of flooding, in part because no single entity has ever conducted a nationwide assessment of the adequacy of our flood control infrastructure.

In fact, no single entity even knows where all the flood control infrastructure is located, let alone its condition. In response to this need, Chairman Duncan and I introduced H.R. 4650, The National Levee Safety Program Act. This legislation represents the first step in a larger effort to locate and assess the conditions of the Nation's flood control infrastructure and to develop uniform guidelines for levee safety. However, this legislative proposal takes only the smallest steps in addressing the larger issues of assessment, adequacy or proper maintenance of flood control infrastructure.

Mr. Chairman, last year, the American Society of Civil Engineers released its fifth report card on the condition of the Nation's infrastructure. On average, they gave the Nation a D grade, and estimated that more than $1 trillion would be needed to address the backlog of maintenance and required infrastructure upgrades.

Unfortunately, this report card did not or was not able to include an assessment of the Nation's flood control infrastructure, other than dams. Yet in spite of the obvious need for increased spending on infrastructure, the Administration and the Republican-led Congress have proposed cutting funding for both the—not you—both Corps' construction and operation and maintenance activities, further perpetuating the backlog of necessary work on flood control protections.

Although I am pleased to work with the Chairman on this legislation to identify and hopefully one day assess and improve the conditions of the Nation's flood control infrastructure, I remain concerned whether we will take the next steps in ensuring adequate protections for our citizens' lives and livelihoods. Once we know where the problems are, will we have the fortitude to ensure that potential gaps in the Nation's flood control infrastructure are addressed?

Again, I thank the Chairman for holding this hearing, and I look forward to hearing our witnesses' testimony. Thank you.

Mr. DUNCAN. Thank you very much, Ms. Johnson.

Mr. Gilchrest.

Mr. GILCHREST. Thank you, Mr. Chairman.

Just a brief couple of comments. I want to thank you and Ms. Johnson for the legislation. I have another hearing going on and I may have to step out. I am not sure if I will be here in time for questions, and I can probably call General Riley and some of the other witnesses a little bit later on this. But I would like to get these questions on the record.

I know there is a vast array of levees around the Country, not to mention those in the Gulf of Mexico or Sacramento or places like that. The focus is on Louisiana, and I hope I can stay to get the answers a little bit later, but how many miles of levees in Louisiana need to be rebuilt? How many are going to be rebuilt? How many are going to be moved from one side of the road to the other side of the road? Is there an evaluation as to which ones should be moved? Because I understand in Plaquemines Parish, there is going to be quite a long stretch that is actually going to be moved, which is along the Mississippi River, the west side of the Mississippi River, to the other side of the road, because of the failing nature of that particular levee.

And should we consider moving people away from areas permanently where levees are failing or don't meet a reasonable cost benefit analysis? This is a big job, and we are here to help. We are from the Government. Well, actually, we are here from Congress, and we are here to help.

Thank you, Mr. Chairman.

Mr. DUNCAN. Thank you, Mr. Gilchrest.

Ms. Tauscher.

Ms. TAUSCHER. Is my friend from Maryland suggesting that the Congress is not the Government?

[Laughter.]

Ms. TAUSCHER. Thank you, Mr. Chairman. I have a brief statement and I really appreciate the time to be able to engage these fine witnesses, especially our witness from California.

I will submit my whole statement for the record and I will try to be brief. But I think what is clear is the magnitude and the content of today's hearings cannot be underestimated, both for our Nation and for my California district in particular.

While the Federal, State and local governments have invested a great deal of capital in building a wide array of barriers and flood barriers, we know that we have done too little to ensure that those systems have been maintained to an appropriate standards. The protection of human life and the viability of our Nation's economy requires our immediate attention and action.

I congratulate the Chairman and Ranking Member for introducing The National Levee Safety Program Act. I believe the Chairman's ambitious yet necessary plan to inventory and assess our Nation's levee systems is a way we can begin to get our arms around the scope of the problems we are facing. Using the best science available, we should conduct a detailed review of design, maintenance and natural conditions that play a role in whether a levee will succeed or fail.

Mr. Chairman, in my own district in California, which contains a large portion of the San Francisco Bay Delta, we know what it

is like to live behind, to maintain and to rely on levees. The Bay Delta, a vast network of earthen levees, supplies drinking and agricultural water to over 22 million Californians, and millions of acres of farm land. And more and more of these levees are protecting the lives and property of thousands of Californians living in my district.

Should there be a massive levee failure in the Delta, not only would there be a great risk of loss and life and property, but California's major water supply would essentially be shut off. On a smaller scale, we have begun to take similar action to that laid out in the Chairman's bill. As part of the Cal-Fed legislation adopted in the 108th Congress, the Army Corps of Engineers is carrying out both the Cal-Fed Levee Integrity program and the Delta Risk Management Strategy.

These two programs are geared to identify and repair the Bay Delta's most vulnerable levees while laying out a strategy fore the long term future of the levees in the Delta. Unfortunately, the President's budget didn't include funding for either of these programs, a mistake which I hope this Congress will correct.

Mr. Chairman, I point out the work going on in the Bay Delta because I believe it is a good example of why your legislation is so important. We first need adequate knowledge of the problem we are facing before we can adopt any remedy. And Mr. Chairman, I would also like to speak to one issue which I hope you will work with me on as your legislation moves forward.

As the Chairman knows, there are thousands of miles of levees that the Army Corps of Engineers had no part of constructing. For example, in the Bay Delta, it is my understanding that there are only two levees there that were built or maintained by the Corps. This is out of hundreds of levees in the Delta.

While I know the Chairman's bill will contain language to help ensure that all levees are inspected and catalogued, I would like to work with the Chairman to explore language which would more explicitly include these non-Corps levees.

Mr. Chairman, I thank you for your indulgence this morning. I look forward to working with you to advance this legislation and to today's testimony, and I yield back the balance of my time.

Mr. DUNCAN. Thank you very much, Ms. Tauscher.

Mr. Pascrell.

Mr. PASCRELL. Thank you, Chairman Duncan, Ranking Member Johnson. It is a tremendous shame that it took Katrina, a disaster, for the Federal Government to focus on the importance of this flood protection infrastructure, such as levees. While we cannot control mother nature, proper flood control measures could have reduced the number of deaths and limited the economic devastation around the Gulf.

I feel so strongly about the mission of the Committee as we continue to call attention to the larger issue of the need for infrastructure investments nationwide. The Nation witnessed the catastrophic consequence that is possible when these levees fail or are breached by massive flooding. We must not let Katrina's hard-learned lesson pass us by.

But it is important to recognize that many other cities around the Country face the same if not greater risk of flooding. In fact,

it was painfully clear to the people of Northern California just this past week. Fortunately, there were no injuries or loss of life.

In New Jersey, levees protect both urban and rural areas. However, the location and conditions of many of the levees are unknown. Nobody knows where they are, to the Federal or State government. We do not know how many people depend on levees to protect their homes and businesses from flooding. I daresay that those people don't know, either, how significant the levee may be.

We have a very serious problem throughout this Nation and various States about flood mapping. Much of that mapping is antiquated, no longer is timely, needs to be reviewed. I know that this is basically controlled by each State. What is the Federal Government's responsibility in making sure that the flood maps reflect the exact situations now?

While there are now strict engineering standards required when a Federal levee is designed and built, there are certainly thousands of miles of other levees built by States, towns and farmers and landowners. Some of these are well built, well maintained levees. Others are not.

One might ask, how many miles of levees are not even accounted for? Do we have an estimate of that?

Time, too, has taken its toll. Natural and man-made changes have altered the landscape and the effectiveness of existing levees. Levees originally designed to protect farm land may now be protecting homes or businesses. It is unfortunate that we only learn about the condition of these and other levees when they fail or the system is overwhelmed. I am therefore pleased that we are here today to discuss H.R. 4650, which will establish a Federal program to work in partnership with the States to help remedy the situation. The inventory, the inspection, the assessments of our Nation's levees will allow the Corps of Engineers and States to work together to identify unsafe structures.

Is the Army Corps up to doing this, Mr. Chairman? And do they have the resources and will we provide the money for them to do it? Or are we simply whistling in the wind?

Than you, Mr. Chairman.

Mr. DUNCAN. Thank you very much, Mr. Pascrell.

Mr. Shuster.

Mr. SHUSTER. Thank you, Mr. Chairman. I appreciate your having this hearing today and highlighting the importance of us taking a close look at the levee system in this Country, especially for you introducing The National Levee Safety Program Act.

There are about 15,000 miles of levees in this Country, and while most of them, the majority of them I would say, were well constructed and well maintained, we don't know how many of them or what percentage for sure are not maintained the way they should be, or maybe it was poor construction when they were put in. I think we can't be in the dark over knowing that.

I know in Pennsylvania, one of my communities, Meyersdale, Pennsylvania, in 2004, Ivan washed the levee away. If we would have known the condition before the hurricane hit, we might have been able to save thousands and thousands of dollars of property damage. But it is extremely important that we know that and I think it's important to know if the Corps is up to the challenge.

And again, Mr. Chairman, thank you for introducing your legislation. We should be shedding light on this matter, so thank you.

Mr. DUNCAN. Thank you, Mr. Shuster.

Mr. Taylor.

Mr. TAYLOR. I'm actually going to have to leave. Thank you, Mr. Chairman.

Mr. DUNCAN. Okay. Mr. Boustany.

Mr. BOUSTANY. Thank you, Mr. Chairman.

I too appreciate your bringing this legislation forward and holding this very important hearing. Certainly in the wake of what happened on the Gulf Coast, in the previous hurricane season, this is a very timely subject and very worthy of investigation. So I look forward to hearing the testimony.

Mr. DUNCAN. Thank you very much.

Mrs. Schwartz?

Mrs. SCHWARTZ. Nothing at this time, Mr. Chairman, thank you.

Mr. DUNCAN. Mr. Miller?

Mr. MILLER. Thank you. I am very interested in the testimony today.

I am not sure what authority the Army Corps has over State and private levees, so I would like to hear that addressed. And there are some questions arising from what should be required, possible failures near levees, and I am not sure how we determine that unless we know they are prone to failure. And requiring flood insurance and such in those areas that we are not sure that are really at risk is of tremendous concern to me in California. So I look forward to the testimony today.

Thank you.

Mr. DUNCAN. Thank you very much.

We have a very distinguished panel here today. Representing the U.S. Army Corps of Engineers is Major General Don T. Riley, who has been with us before, the Director of Civil Works. Representing the National Association of Flood and Stormwater Management Agencies, Mr. Peter Rabbon, who is the President of that group. He comes to us from Sacramento.

Representing the Association of State Floodplain Managers, Inc. is Ms. Pamela Mayer Pogue, who is the Chair of that group. She is from Cranston, Rhode Island. And finally, representing the American Society of Civil Engineers is Dr. Peter Nicholson, who is Associate Professor of Civil and Environmental Engineering. It doesn't say where he is professor, but maybe he can tell us that. He is from Honolulu, Hawaii.

So we have witnesses that have come from very long distances. We are very grateful for each of you being here. We always proceed in the order the witnesses are listed in the call of the hearing. So General Riley, you may begin your statement.

TESTIMONY OF MAJOR GENERAL DON T. RILEY, DIRECTOR OF CIVIL WORKS, UNITED STATES ARMY CORPS OF ENGINEERS; PETER RABBON, PRESIDENT, NATIONAL ASSOCIATION OF FLOOD AND STORMWATER MANAGEMENT AGENCIES; PAMELA MAYER POGUE, CHAIR, ASSOCIATION OF STATE FLOODPLAIN MANAGERS, INC.; PETER NICHOLSON, PH.D, P.E., M.ASCE, ASSOCIATE PROFESSOR OF CIVIL AND ENVIRONMENTAL ENGINEERING, UNIVERSITY OF HAWAII

General RILEY. I am pleased to be here today and have the opportunity to speak to you about the National Levee Inventory and Technical Assessment Program. My testimony today will provide a brief background and update to the Committee on the progress made to date by the Corps of Engineers in the development of a national levee inventory.

Although nearly 9,000 miles of levees have been constructed by the Corps of Engineers, this accounts for only a portion of the total number of structures protecting communities. Presently, there is no data base or single source of information concerning these structures.

Emergency supplemental funds appropriated in December 2005 included $30 million for the Corps of Engineers to initiate a national inventory of flood and storm damage reduction projects, including an assessment of the condition of levee projects.

In addition, the President's budget for fiscal year 2007 includes $20 million to continue this effort. To be effective, we are coordinating this effort with the FEMA Map Modernization Program, and we envision that data from the inventory will provide technical information to be used as a basis for periodic recertification of levees as required by FEMA for flood mapping purposes.

The inventory will be a geospatial data base that will allow data to be incorporated into the flood maps prepared by FEMA. The Corps will also continue to coordinate with the Association of State Floodplain Managers and the National Association of Flood and Stormwater Management Agency on this inventory.

We are presently developing a criteria for assessments and we will develop these procedures and methods for conducting the assessments in a uniform and consistent manner. The assessments will rank projects using risk to human life and benefits of protecting population centers and the national inventory will provide an overall condition of levees and indicate areas of higher risk.

We are committed to putting a program in place that will enable us to better evaluate the risks to public safety in areas located behind the levees and help decision makers set priorities for future investments. This work will also ensure that the public can make more informed decisions on building homes, locating business and purchasing flood insurance, based on the actual risk of flood and storm damages where they live.

This concludes my statement. Again, I appreciate the opportunity to testify and I will be pleased to answer any questions you might have. Thank you.

Mr. DUNCAN. Thank you very much.

Mr. Rabbon.

Mr. RABBON. Good morning. Pete Rabbon, with the Department of Water Resources, State of California, and as President of NAFSMA, I am pleased to present this testimony on their behalf.

NAFSMA is an organization of over 100 local and State organizations that provide services to over 76 million citizens of the Nation, in cooperation with the Corps, FEMA and EPA. We are supportive of The National Levee Safety Program Act and today we offer suggestions to the Act for your consideration.

First, we recommend you focus on a national levee inventory. You must identify all the Federal, State, local and private levees. We need to know the universe of levees. As an example, California has embarked on such a program. We have located almost 12,000 miles of levees in California statewide, of only which approximately 2,000 are Federal levees. We suggest the inventory program be administered at the Federal level, but developed with local and State input such as to maximize the use and maintenance of such a data base.

Secondly, assessments. The bill does speak of inspections and inspections are key for operations and maintenance and identifying gross problems with a levee. However, a strong assessment program is critical to determine the true condition of the levee. As an example, California estimates it will cost approximately $100 million to do technical assessments on the 2,000 miles of Federal levees.

Thirdly, we suggest you consider linking other Federal agencies and programs to maximize the benefit of H.R. 4650. For example, FEMA's remapping program, which we heard mentioned, would benefit greatly from having the levee information that could be developed by the Corps of Engineers through such an inventory program.

Additionally, H.R. 4650 recommends an inspection program. The Corps already has an inspection program of completed works for existing Federal levees.

Fourth, establishment of the levee safety program and the National Levee Safety Review Board should consider having local and regional representation. This is for two reasons. First, the non-Federal partner with the Corps of Engineers on levee projects is almost always a local or regional entity, such that they are the party responsible for operations and maintenance of the levee.

Secondly, if this is to be a broad program, the land use decisions are made by local and regional entities. So there are two reasons why we strongly recommend local and regional involvement.

Fifth, funding. Adequate funding is critical. Using California as an example again, we have embarked on a five year program for developing a levee data base. The program is expected to cost $2.5 million total, and this is strictly for California. It will develop a geospatial data base. It will allow us to locate all the levees. We will be able to populate the data base with available data and have a gross ranking, and gross is key on this, of the criticalness of the various levees.

That program in itself is $2.5 million. It does not include maintenance of the data base or completely filling that data base.

I would like to add two items that are indirectly related to The National Levee Safety Program Act, but I think critical for your

consideration. First is the Corps' policy and guidelines, that you look closer at that, because those are guidelines to look at economic benefits of protecting property and infrastructure. Today, after the devastation we have seen, we suggest you look at a fundamental concept of adding protecting lives and providing public safety when determining what projects to fund through the Corps of Engineers programs.

Then finally, we suggest you consider broadening the goal of The National Levee Safety Program Act and consider creating a flood management technical advisory committee. And the mission of that committee would be to bring together the various Federal agencies to facilitate and coordinate Federal policies, so that a package of compatible and implementable Federal guidelines exists for future flood prevention, response and recovery activities.

Thank you for your time.

Mr. DUNCAN. Thank you very much, Mr. Rabbon.

Ms. Pogue.

Ms. POGUE. Good morning, Mr. Chairman, Ranking Member Johnson and members of the Subcommittee.

I am Pam Pogue, Chair of the Association of State Floodplain Managers. My real job, if you will, is I am the State floodplain manager from Rhode Island.

We appreciate the initiative of this Committee under the strong leadership of Chairman Duncan to address our Nation's urgent need for more data and better information about where our levees are and their physical condition. ASFPM supports H.R. 4650 in general, but would also like to provide you with suggestions on how we feel the bill might be strengthened.

The catastrophic hurricane disasters of this past year vividly remind the Nation that we are vulnerable to the effects of natural hazards, especially flooding, and that we must have programs, policies and institutions that can adequately handle these events, efficiently use taxpayers' money and build a more sustainable future for our citizens. Nothing less than our Nation's prosperity and viability are at stake.

The Association of State Floodplain Managers has over 9,000 members and 22 State chapters. We represent the State and local officials and other professionals engaged in all aspects of flood loss reduction, floodplain management and hazard mitigation. This includes mapping, engineering, planning, community development, hydrology, forecasting, emergency response, flood protection projects and insurance.

Many of our members work in communities impacted by Hurricanes Katrina and Rita and work with organizations assisting those communities to rebuild. All Association members are concerned with working to reduce our Nation's flood related losses and in rebuilding a safer Gulf Coast.

Our State and local officials are the Federal Government's partners in implementing programs and working to achieve the effectiveness of flood loss reduction. Make no mistake about it: the potential for levee failure with catastrophic consequences and human suffering is not just a New Orleans problem. Levees in California are a disaster waiting to happen, complicated with earthquake risk, for example.

Every State has levees. We just don't know where they are, the physical conditions of these structures or the number of people and structures and critical facilities at risk behind these levees. All of this points to the need for a comprehensive levee safety program for the Nation and for national inventory of levees.

As I mentioned previously, ASFPM is in support of H.R. 4650 in general. We have a few suggestions. First of all, as many of the panel members have already mentioned, focusing first on an inventory of levees is critical, with a cursory assessment of risk for each. It is critical that data be collected in order to make any determination of the magnitude of this problem. This data will be a vital foundation for the design of a levee safety program.

Secondly, the long term levee program will have to focus on States because they are the only entities with authority to regulate design, construction, operation and maintenance of levees. The Federal Government can encourage but cannot mandate.

Third, incentives to States must be built into a levee safety program. Perhaps levee safety expenditures can be banked against the non-Federal share of future disaster costs in that State.

Fourth, levee data must be geospatial and readily accessible for ongoing inventory and risk assessment and in a manner compatible with other Federal data bases, such as FEMA's Mapping and Modernization Program, the U.S. Geological Survey and the NOAA's weather data program.

Safety standards for levee construction must be developed. This should establish criteria and definitions for high, moderate and low risk levees to allow setting for priorities. We need to know, where is the real risk with these various levees.

Sixty, detailed engineering analysis and design of engineering remedies is the function of levee owners and sponsors, not the Federal Government. There is ample expertise in the private sector for non-Federal levees. Federal and State policy groups should be charged with recommending standards for various levees in the Nation. The Association recommends standards for urbanized areas and critical facilities using at least a .2 percent or 500 year flood event and in coastal areas, a category five storm surge.

Finally, levees should not be built to protect that is undeveloped. As a Nation, we have a long history of taking our rural infrastructure and upgrading the infrastructure to meet the demands of growing and expanding populations. The dirt farm road becomes the paved farm road, then the market road, which then becomes State highways as the population expands to meet those needs. No such similar upgrade, however, in infrastructure can be found with many of our Nation's levees. In essence, we are pretending that a dirt farm road can serve the same function as an interstate highway.

In transportation, this failure to plan, improve and maintain public roadways leads to a traffic jam. In levee management, this failure to plan, upgrade and maintain leads to catastrophic damages, loss of life and loss of property, potentially destruction of a local economy.

Lack of available data on levees and the inability to accurately know where the people are at risk behind them are two very serious problems. With specific regard to H.R. 4650, we think the bill

should focus on the Corps of Engineers' production of an inventory of all levees in the Nation, or at least those that pose a subset highest risk to humans. Secondly, provide an assessment of the general condition of those levees, and third, provide the data base that can lead to a national levee safety program between States and levee owners.

ASFPM believes that a properly designed State levee safety program is appropriate. The program presented in this bill is patterned after the State dam safety programs and the Federal dam safety program, which have some inherent weaknesses. These programs have become in essence a permit function and have led to a stovepiping effect, which in the case of levee safety could effectively separate levee safety from management within the floodplain. A State levee safety program is integral to the State's floodplain management program.

We feel the funding is inadequate at $10 million a year. In terms of engineering studies, we see this part of the bill as potentially a real problem. We don't think the Federal Government should be in the business of performing engineering inspections and designing engineering remedies. There is plenty of private sector expertise. Levee owners should be told to hire an engineer for inspection and design. The Corps should collect data and do cursory inspection to report on the heights, general condition and maintenance and to inform owners in the State of their findings. This should only be done for levees in the high and medium risk categories.

We do not believe that the Corps has the authority to order repairs for levees. States can do so if they have a law to that effect and pass them, as some have.

Mr. Chairman, even before the 2004 and 2005 hurricane seasons, flood losses in the Nation exceeded $6 billion a year. I an the Association of State Floodplain Managers greatly appreciate the chance to provide our thoughts on these issues. We are committed to working with you and your Committee in order to reduce the flood losses in this Nation.

Thank you.

Mr. DUNCAN. Thank you very much, Ms. Pogue.

Dr. Nicholson, I understand you are from the University of Hawaii. You are welcome here. You may begin your testimony.

Mr. NICHOLSON. Thank you.

Good morning, Mr. Chairman, Ranking Member Johnson, members of the Subcommittee. My name is Peter Nicholson, as you have heard. I am pleased to appear today to testify on behalf of the American Society of Civil Engineers as you consider H.R. 4650, The National Levee Safety Program Act. I am a member of ASCE and I chair ASCE Geo-Institute's Committee on Embankments, Dams and Slopes.

In 2005, last fall, I assembled an independent team of experts and traveled to New Orleans to collect data and make observations necessary to carry out the assessment of the performance of the flood control levees in New Orleans after Katrina.

As engineers, our paramount concern is for the safety, health and welfare of the public. We have learned a great deal from the tragedy of New Orleans, and in order to help prevent future loss of life and property in Louisiana and elsewhere in the Country. We

support the Federal, State and local agency efforts to ensure that all infrastructure systems are one, robust, strong enough and reliable enough to do the job for which they are designed; to contain redundant systems to prevent total system failure; and to ensure that these systems are resilient enough to allow them to be quickly repaired when the inevitable failures do occur.

Based on these basic engineering principles and our findings in New Orleans, we believe that Congress should enact H.R. 4650 with some modifications. ASCE has some policy recommendations for H.R. 4650 and specific amendments to recommend to the Subcommittee. For the levee inventory, which we have been hearing is of paramount importance, the bill authorizes the Corps to maintain an inventory of levees at its discretion. The inventory should be compulsory. The Corps needs to account for every Federal, State, local and privately owned levee in the Country. Without one, we run the risk of missing potentially life-threatening conditions with levees that are not accounted for.

The national inventory of dams, the data base maintained by the Corps, covers all dams in the United States, including State and local dams and privately-owned dams as well. The levee system requires a correspondingly complete survey.

Regarding levee inspections, the bill would require the Corps to carry out one-time inspection of every federally-funded levee. We believe the bill should be amended to require periodic levee inspections as well as the identification and inspection of larger independent flood and storm protection system within which the Federal levees function.

The bill also requires States to carry out levee inspections at least once every five years for levees posing the greatest danger to human life, in order to receive assistance to support the levee programs. We believe this provision is too limited. Every levee, whether owned by Federal, State or local agencies, or by private entities, that would pose a significant threat to human life and property in case of failure should be inventoried and inspected.

This category would consist of levees deemed to pose a high hazard in the event of a failure, a category comparable to the requirements for high hazard dams under The National Dam Safety Act.

Regarding peer reviews, ASCE strongly supports the use of independent project peer reviews for every new civil engineering works project or significant modification to existing systems whenever any one of four key principles is implicated. Sound engineering principles require independent peer reviews by outside experts when one levee's performance is critical to public health, safety and welfare, when levee reliability on emergency conditions is critical, when using innovative materials or techniques to build levees, or when the levee design is lacking in redundancy or short construction schedule.

We also believe that America's civil works infrastructure remains vulnerable to man-made attacks. H.R. 4650 should be amended to require a court to carry out vulnerability risk assessment to determine which of America's major levees may be susceptible to destruction by terrorists.

Regarding appropriations, the bill authorizes $60 million, $10 million a year for six years. The overall appropriation level we be-

lieve should be doubled to $120 million. We recommend an additional authorization of $20 million in the first three years to conduct the national levee inventory required under Section 4.

ASCE believes the bill should be amended to authorize annual appropriations for the creation and maintenance of levee safety programs within the Corps of Engineers. Specifically, $7 million annually for State assistance to implement levee safety programs, $1 million annually for the maintenance of national levee inventory, $1 million annually for the bill's research program on levee safety training programs.

That is the end of my testimony. Thank you, Mr. Chairman. I would be pleased to answer any questions you may have.

Mr. DUNCAN. Thank you very much, Dr. Nicholson. Very fine, very informative testimony by all the witnesses.

I am going to go first, in my members, go first to Mr. Gilchrest for any questions that he has.

Mr. GILCHREST. Thank you, Mr. Chairman.

I would ask basically the same questions that I went through earlier. But I would add, we don't have the same kind of problems in Maryland as I am sure they do in Sacramento. I haven't seen the levees in Sacramento. I have seen extensive levee systems in Louisiana that I know are under great scrutiny at this time and also being repaired and analyzed and so on.

I am not sure if you can answer these questions at this point. But Mr. Chairman, I would like in some way to have a follow-up so these questions can be given to the Committee. I guess I would say the first question is, how many miles of levees in Louisiana or in and around Sacramento, California, need to be rebuilt? Is that an appropriate question? Is there an answer that someone can come up with that?

General RILEY. Mr. Gilchrest, if I could take the first stab at it. In the greater New Orleans area, down in Plaquemines Parish as well, and across the river, there is about 350 miles of levee system there. During Katrina, 169 miles of those levees were damaged. We are repairing all 169 of those miles and those projects will be complete this June.

You did ask also a question about any that might be moved. The only thing that will come close to that is, we do have one proposal we're considering, there are non-Federal levees in Plaquemines Parish, about 35 miles, that might be appropriate to incorporate into the Federal system. Those levees, though, are really simply soil that was piled up from the wetlands. So we wouldn't build on top of those. We would move off to the side and really re-engineer a new levee, if the Administration chooses to propose that.

Mr. GILCHREST. So those are levees along the Mississippi?

General RILEY. No, sir, the Mississippi River levee itself would not be moved. These ones in Plaquemines are on the back side off the river on the wetlands side of the Parish.

Mr. GILCHREST. I see. You can't build on them, so they would have to be moved?

General RILEY. Moved to the land side of that levee rather than the wetlands side. We would want to avoid as much as possible any environmental impacts. So we would want to build new levee toward the land side of those existing levees.

Mr. GILCHREST. So that is about 35 miles. Is that a contiguous 35 miles?

General RILEY. Yes, sir, it is, on the west bank of Plaquemines Parish.

Mr. GILCHREST. I see.

General RILEY. That is presently under consideration by the Administration.

Mr. GILCHREST. Were they damaged during the two previous hurricanes, those 35 miles?

General RILEY. Yes. Those are again relatively small, non-Federal levees.

Mr. GILCHREST. Do you have an estimate of the cost for those, that 35 miles?

General RILEY. No, sir, in fact we were looking over all those figures last night. All those figures are under review right now.

Mr. GILCHREST. You have made a recommendation to move about 35 miles of those levees. If that recommendation is approved, how long would it take to actually start construction?

General RILEY. Well, sir, given certainly authority and funding, we could start relatively quickly because of the contracts we already have in place in the area.

Mr. GILCHREST. So in your estimation, in the Louisiana area, only about 35 miles of levees in that levee complex would actually have to be moved?

General RILEY. Yes, sir, that that's really, in my sense, engineering sense, not really a true move of the levees. We will just simply build them to the land side.

Mr. GILCHREST. I see. Any estimate of the cost of the 169 miles that were damaged, to be repaired?

General RILEY. Sir, I don't have those figures with me. I would like to take that question for the record, if I could.

Mr. GILCHREST. Is there any area, whether it is in Sacramento, Louisiana, any area around the Country, of significance, similar to what was done in the upper Mississippi flood of the early 1990s, where they actually, the Corps and other agencies, actually moved communities from one place to another? is there any consideration or recommendation in Louisiana or maybe Sacramento that the Corps would recommend or consider moving a community as opposed to trying to rebuild a failing levee system?

General RILEY. Sir, at this point, I think the Administration is looking to the State to take the lead on any zoning laws which is appropriately within the State's authority to do and make any recommendations.

Mr. GILCHREST. Thank you very much. Thank you, Mr. Chairman.

Mr. DUNCAN. Thank you, Mr. Gilchrest. Mr. Taylor.

Mr. TAYLOR. Thank you, Mr. Chairman.

I do want to commend the Chairman's interest in this. I am a little confused as to what it might accomplish other than what already exists.

So for instance, General Riley, in the case of the levees in New Orleans that failed, when were they last inspected?

General RILEY. Sir, the levees that failed, and certainly the interior ones, interior drainage canals, those were turned over to the

local communities. Once the Federal Government constructs a levee, we turn it over to local sponsorship, for ownership and operations and maintenance. Within the past year, prior to the storm, they were inspected by the local owners with Corps participation.

Mr. TAYLOR. Okay, just for the heck of it, what does a levee inspection entail?

General RILEY. Sir, what the levee inspection entails is a visual inspection of the levee to ensure that the local owners are maintaining that in accordance with the operations and maintenance manuals.

Mr. TAYLOR. Okay, so again, for a novice, you are talking about shrub removal so that the roots don't penetrate the levee. Do you run periodic soil borings to see what is going on?

General RILEY. No, sir. That would be up to the local owner and operator to do that.

Mr. TAYLOR. Okay, now, I went to school in New Orleans. So on your lake side, you have turned it over to the city.

General RILEY. Yes.

Mr. TAYLOR. And the river side is the Corps' responsibility. This contrast, on the river side, how often do you run soil borings?

General RILEY. Sir, those riverside levees are also run by levee boards up through Louisiana. We look for visual inspection, visually inspected and any suspect areas then would be, we would conduct subsurface investigations. If we had noticed any sloughing or any kind of evidence of any other impending failure, then we would conduct a further investigation.

Mr. TAYLOR. What if anything would have tipped you off or the New Orleans Levee Board off to the potential problems with the 17th Street Canal? What would have tipped you off? What would it have taken to have known in advance that something was going to happen?

General RILEY. It would have taken a soil boring. Because what our forensics investigators have found, and certainly Dr. Nicholson has reviewed some of that work, as the failure mechanism was due to initial deflection of the wall and then a weak layer of clay down below the sheet pile. So to find those two conditions, it would have taken soil borings in order to determine that.

Mr. TAYLOR. Okay. Now, I am kind of familiar with this, because I am going through soil borings to rebuild my home. They tell me in the case of my home, one soil boring in the middle of this 100 feet is going to be enough. But for a really accurate test, in a place like Louisiana, how often would you, how close together would those borings have to be for you to have a level of comfort that would, beneath the surface, that needs to be there?

General RILEY. I don't know if can answer that specifically, because it would be different for different conditions. But additionally what you would have to do, like under the Dam Safety Program, any assessment of a levee would require looking at tall the plans, looking at previous inspection works, doing certainly a surface survey and indicators, and looking at recalculating sort of the hydraulics of the floodplain.

So any time there is new development, or a new storm, the hydrology of the area changes. So it would require all those compo-

nents, not just borings. So borings 100 feet apart in many areas would be more than sufficient.

Mr. TAYLOR. I guess what I am getting at, General, is, and again, I commend my colleague from Tennessee for wanting to help. It is not just a Louisiana problem or an upper Mississippi River problem. It is, as he mentioned, a national problem.

What I am concerned about and what I hope we can address is, is there really a way to legislative a national program to adequately inspect thousands of miles of levees?

General RILEY. Sir, if I could compare to the Dam Safety Act, Dam Safety Program, which was legislated in 2002, that has many of the necessary components: inspection, inventory and interagency committee, dam safety review board. The program, which lays out procedures for inspection assessment, the data base, research and training program, all those components are very, very good components to have in a program.

And when you have all that, then you can very systematically, and of course if it was funded properly, very systematically look at the highest risk areas. So that is what we do in our Dam Safety Program. We have 620 dams in the Corps; there are 80,000 in the Nation. We look at our portfolio of dams and then look at what are those that are at the highest risk and then begin the more in-depth inspections and assessments on those and repairs as necessary.

Mr. TAYLOR. Will the Chairman oblige me for one last question?

Mr. DUNCAN. Sure.

Mr. TAYLOR. In the case of the 17th Street Canal, you have been at this a long time, and you all are the pros. Is there anything that from a visual inspection would have tipped you off, you in particular, since you have been doing this for a long time, that something was amiss below the surface? Or would only a soil boring have told you that something was wrong?

General RILEY. What we don't know, and Dr. Nicholson might speak to it as well, is, we know the mechanism of failure, we don't know what initiated deflection, whether it was a tree that was blown over and caused a seepage path, whether it was a swimming pool that was dug behind the levee which reduced some of the pressure, whether it was Formosan termites, which there is evidence of, or nutria, that there was evidence of.

So any of those four things could have been visual indicators of a problem which may have led to the initiation of deflection. We don't know that answer yet. But those are four examples that could possibly have indicated a problem.

Mr. TAYLOR. Okay, thank you, Mr. Chairman.

Mr. DUNCAN. Thank you, Mr. Taylor.

I won't take the time to give a lengthy or complete answer, but as General Riley said, all the experts say that the National Dam Safety Program after which this bill is patterned has led to great improvements in dam safety all over the Country. We hope that this will do the same for our levees.

The staff tells me that they have found on inspection trips, for instance, in New Orleans, they found trees growing on some levees, which creates problems. They even found one case in which a swimming pool had been built into a levee. We do know that throughout the Country, there are many places where these State

and local levees have not been inspected or improved for apparently many years. So we are just trying to—we know we can't create a perfect situation, but we are trying to help, to the extent that we can.

Mr. Boustany.

Mr. BOUSTANY. Thank you, Mr. Chairman.

Clearly we have had, down in Louisiana, a lot of problems with regard to how the Corps interacts with a lot of different local levee boards, and Louisiana just took steps to consolidate, which I applaud. I think it was good. I would have liked to have seen one levee board, but we have two.

Could you comment, General Riley, on the difficulties you have had or the Corps has had in having to deal with so many cost share sponsors in a given locale, such as New Orleans?

General RILEY. I think the challenge, sir, would be typical with any project that has a local sponsor. In this case, you have a system with multiple local sponsors. Each one of those sponsors has different funding sources themselves and different ability to fund a piece of their segment of the system. So the great challenges is, how do you take components and avoid a piecemeal approach, but take a more systematic approach.

So the cost sharing challenge has caused us to a greater challenge, I guess is a better way to say it, and taking a systems watershed approach to any hurricane protection or flood system like that. So that's probably the greatest challenge.

Mr. BOUSTANY. Thank you.

Mr. Rabbon, you were talking about the efforts in California. How are you funding this?

Mr. RABBON. There are various efforts that we are undertaking. The most recent one is the repair of 24 critical erosion sites that is being funded through an emergency program. The Governor declared an emergency and it did open up special funds.

Other activities that we are moving forward on are primarily in cooperation with the Corps of Engineers through existing Federal programs. Then the levee inventory program that I spoke of is partly funded by the State of California general fund. And then we do have a grant from FEMA.

Mr. BOUSTANY. There is no dedicated tax revenue stream that goes onto this, then? It goes through the appropriations process at the State level?

Mr. RABBON. Correct.

Mr. BOUSTANY. Okay. Thank you.

Ms. Pogue, you had made a comment that levees should not be built in undeveloped land. Do you include farm land as undeveloped land, or how would you deal with very vital farm country?

Ms. POGUE. Not necessarily, sir, but I think what happens is we have seen with many of the levees throughout the Country is, as they say, if you build it, they will come. You have a levee that was initially designed, and we are talking about safety standards here, and we are talking about public safety and regulatory standards and so forth. If you build a levee to a certain standard, you can't then on the other side of that levee, if it is built to a lower standard, put in a very dense subdivision or critical facilities or those sorts of things.

So I think what you need to be careful with and what that statement is referring to is when you build a levee or you design a levee you really have to look at, which we get back to, State oversight and local oversight with land use and zoning, what is going to be on the other side of that levee.

Mr. BOUSTANY. What about vital transportation routes? For instance, in Louisiana, and of course, starting in Texas and going all the way to Florida, we have the intercoastal waterway, which is a vital transportation route. I know going through my district, the banks of that are not considered levee, it is considered spoilbank. So it is up to private property owners to maintain it. I can tell you, having visually seen what those banks look like prior to the hurricanes, and of course afterwards, it caused significant problems.

Could you comment on vital transportation routes and levees and do you think that this is a Federal function, State function, some combination? How would you deal with it?

Ms. POGUE. Funny you should ask. I grew up on the intercoastal waterway in Florida, and we had to spend an entire summer putting in tiebacks and digging down to the water table. So I am very, very familiar with what it is like living on the intercoastal waterway. I think again, as we put in our written testimony, it does have to be something that comes from the States, in those instances where there are non-Federal levees.

I work with our dam safety program in Rhode Island, and I think we have probably one of the worst dam safety programs in the Country. Unfortunately, we have 582 dams. And you get back to, as you are saying, roadways and so forth, I think it has to be put back to the States. I am saying that as a State regulator, unfortunately, but there perhaps needs to be incentives. One of the things we mentioned in our testimony was possibly even putting in mitigation, putting in these right things and putting that towards the non-Federal share in the event of a public disaster.

Mr. BOUSTANY. One final question for the panel. Do you consider flooding a Federal problem or is it a State or local problem?

Ms. POGUE. If I can jump in real quick, I think it is absolutely a State, local problem in addition to a Federal problem. One of the things that we said about the levee safety program not necessarily modeling after the Dam Safety Act is what we have seen with that, is that there is no integration between floodplain management and dam safety. I don't have a single inundation map for any of the 582 dams in Rhode Island.

So my comment for the local and State, absolute necessity that they get involved, they become part of this. Because it is going to be inherently upon them.

Mr. BOUSTANY. What about the rest of the panel? Any opinion?

Mr. RABBON. I suggest it is a shared problem, local, State and Federal, and even within the Federal Government there is a broad range of agencies, the Corps and FEMA, that we need to bring together or similarly, we need to bring those types of agencies together at the State and local level also.

Mr. BOUSTANY. Thank you.

General Riley?

General RILEY. Sir, I think we all speak with one mind on this. It clearly is a shared problem. There is a Federal interest, of

course, in interstate flooding. But clearly, we look to the States to take much of the lead in flooding problems.

Mr. BOUSTANY. Dr. Nicholson, do you have a comment?

Mr. NICHOLSON. I would agree with my colleagues here. I agree it is a shared problem. I think it is important that one entity, perhaps a Federal entity, oversees something like this. But it has to be on the States and local agencies to actually run the program.

Mr. BOUSTANY. I thank you all.

Mr. DUNCAN. Thank you very much, Dr. Boustany.

Ms. Tauscher.

Ms. TAUSCHER. Thank you, Mr. Chairman.

General Riley and perhaps Mr. Rabbon, I think that in our circumstance in the Bay Delta, as you know, we have a large watershed, we have a lot of wetlands, we have a big bay, we have a bunch of rivers. What we have are hundreds of miles of levees. Only two are Federal levees, which I am now gaining the importance of that.

And many of them are private levees. This is agricultural land, and many of them have been built over the last 100 years, some of them tended to occasionally, some of them tended to and breached, some of them completely ignored. I guess I need clarification on how exactly we are going to fit into all this, because specifically, in our case, there couldn't be in my mind more critical infrastructure. I think it crosses across these many different definitions of what is important. Twenty-two million Californians get their drinking water from there. There are hundreds of thousands of people whose lives depend on the safety and security of these levees, because they are in the way. Agricultural property, not only the value of it, but we are the breadbasket of the world.

So there is a lot of this. So how do I get assurance that, number one, we are going to be classified as critical infrastructure, and make sure that we are covered in the bill that Chairman Duncan is working on, but also how do we get out from this definitional problem of not being, of being treated like a second class citizen because we are not Federal levees?

General RILEY. Ma'am, if I could just address that in comparison to the Dam Safety Program, with all those different aspects of the National Dam Safety Program, it would catch something like that in a levee safety program. Because the value of the data base, the geospatial data base and the inventory, then assessments targeted on the highest risk areas, whether they are Federal or non-Federal. Of course, we would look to the States to take the lead on assessments of non-Federal.

But through that program, and the interagency committee and the safety board, then lay out policies, procedures and guidelines and priorities of where to focus the limited amount of funds that I am sure would be available.

Ms. TAUSCHER. Mr. Rabbon?

Mr. RABBON. If I might add, you are talking of approximately 730 miles of non-Federal levees in the delta area for your area of interest. So that is a major problem. The State has been providing some minimal funding to help support the maintenance of those non-Federal levees. But as the General had said, the way this legislation is written, these levees will be a part of the program. The

downside is because they are non-Federal, they will probably not be eligible for Federal programs where they can receive funding.

At this point, I might toss out a very rough number the State has put together to make the delta levees, just the critical delta levees, reasonably flood resistant and reasonably seismic resistant. That number is $5 billion.

Ms. TAUSCHER. Money well spent in my opinion.

But let's just say this. I think we have identified a rhetorical problem, that is non-trivial to say the least. And I am very anxious to work with the Chairman on this. Because in our specific case, you have a confluence of issues that are very hot button issues. You have private property and property rights. You have basic, completely unregulated levee construction, levee maintenance, to the effect that it exists.

But at the same time, I think no one can dismiss the fact that this is highly critical infrastructure, not only to health and safety, water quality, the agricultural business, and then you have the seismic issue, which on top of just the low maintenance and bad construction and private property domain that these levees exist in, in California obviously every once in a while the earth shakes and bad things can happen.

So I am very anxious, Mr. Chairman, to work with you, because obviously we want to get captured. But once again, we have to be very mindful of private property rights and the fact that that is an issue that we have to deal with as we look to find a way to regulate and maintain and protect. Thank you very much.

Mr. DUNCAN. Thank you very much, Ms. Tauscher.

Mr. Miller.

Mr. MILLER. Thank you, Mr. Chairman. When you are going about doing a geotechnical review and you do borings on native soil, it gives you a lot of insight as to what you are looking at, because you know what the structure of the soil is at different levels. But once you move soil and it is moved by man, it takes on a much more less substantial tone, it tends to be more prone to wear from water, to erosion and such.

So how do you go about doing an assessment for risk on levees, General, that you are unaware exactly of how they were put together originally?

General RILEY. Yes, sir, if we are unaware, if we don't have any of the plans or specifications or anybody that has worked on that project, soil borings would clearly help determine the strength and stability of the levee. Then we would have to look at all the conditions surrounding that levee, the hydrologic conditions, what kind of development around it, what is the latest flood of record, what is the history of flooding in that area, to determine how it responded during the past floods. So all those kinds of factors would be taken into account to determine not just the structural stability, but how it would act within the system of levees.

Mr. MILLER. So you are going to do a hydrology report to determine the amount of flow to a region.

General RILEY. Yes.

Mr. MILLER. You are going to do borings on private and State levees where you don't have specifications available to you. What

is the cost going to be per mile to do an assessment that is a realistic assessment?

General RILEY. Yes, sir, I have asked that question and there is no answer to that, because it would be so changeable, depending on the conditions.

Mr. MILLER. It would not be inexpensive.

General RILEY. Yes, sir.

Mr. MILLER. That is where this whole argument starts to run into a problem, because to do an adequate risk assessment, developing safety standards for each individual levee, and they would vary based on construction and design, what would you have to do to accomplish that?

General RILEY. Sir, what you would have to do is, depending on, you would have to look at all the design records, all the construction records, the record of flooding, and do a survey of the height and the width of the levees, if there is any question about how it was built, then you would want to go with soil borings. Then you do the H&H, the hydraulics and hydrology modeling, to run models of the floods through that area to see how that would respond. So that's where the expense would come.

And of course, we would look to the States to do that and take the lead for non-Federal levees. But what we would want to do is have it all in the data base, so that everybody could look at it and see and touch and feel and manipulate.

Mr. MILLER. I had costs given to me that could equal $60,000 per mile? Does that sound reasonable?

General RILEY. That is not unrealistic.

Mr. MILLER. Okay, so $60,000 per mile times how many miles of levees are you going to review?

General RILEY. The Corps has 9,000 that we—

Mr. MILLER. How many haven't you reviewed that we are considering you reviewing, private and otherwise?

General RILEY. I'm not sure I could even guess a number on the total non-Federal levees.

Mr. MILLER. This $20 million could be—

General RILEY. Oh, no, sir, you are talking the $20 million, the $30 million in the appropriations last year, we proposed another $20 million for the inventory, setting up the data base, the methodology for assessments. And just to get to the most critical Federal levees, that would be ones that we built and maintained, build and turn over to States and maintain or incorporate in our system or the National Flood Insurance Program, can be up to $400 million to assess, the Federal. The non-Federal is separate from that, of course.

Mr. MILLER. Then we get to the next question, which I have a problem with. Once this is accomplished, and once we determine that the levees are safe, your comments said that we should require flood insurance for up to a 500 year flood on any area subject to inundation should a levee fail. How realistic is that? If you build a dam and you mitigate an area, that will take it out of the 100 year floodplain. You build a dam or a levee, and you take it out of the 500 year floodplain.

The 500 year floodplain is a very, very large area, in many cases. Don't you think that's an unrealistic requirement for the Federal

Government to place on people to have to get flood insurance in those 500 year floodplain areas, when we have taken it out of the impact?

Ms. POGUE. I don't, and here is why. First of all, as the General mentioned, I think one of the things that is very, very important which is why it is important, which is what you are getting to, to linking floodplain management with levee safety and dam safety, is I do not know with the dams that I have in Rhode Island what the areas of inundation are, exactly what those areas of inundation are.

I think if one thing has been pointed out through the various pieces of legislation on the Hill since Katrina is people need to know the risks. Whether it is in the FEMA Map Mod program, whether it is in the levee safety program, people really need to understand why they are at risk, where they are at risk and how they are at risk. So I do think it is important.

One other thing that I think, though, when you talk about mandatory purchase of flood insurance, getting to this residual risk issue, is I think that there needs to be a better understanding of what we are talking about when we are talking about the policy costs of what FEMA calls a preferred risk policy. People can live in a 500 year floodplain, which as you say, it can be very, very large, or as we say, fat.

However, a preferred risk policy which has the same coverage can only cost anywhere from like $122 a year. So we are not talking about people living way far away from water or a water course and having to pay $5,000 annual premiums. The preferred risk policy, which also covers those people in a 500 year floodplain, is much less expensive.

Mr. MILLER. If you take an area such as the Sacramento area, it is the second largest flood plain in the Nation other than the Mojave Desert, you are taking into consideration a huge area of development. And the closer you get to the river area, the higher the assessment is going to be based on the insurance premiums.

I think it is a huge windfall for insurance companies. But I am not sure it is a Federal mandate that should be applied. I think that the States or local agencies should apply that mandate, whether the Federal Government designed a standard that States must comply.

So I have a problem with the Federal Government making that mandate. If the State wants to do it, Massachusetts, California, they want to implement that, then I think that is wholly reasonable. But I think it is wholly unreasonable for the Federal Government to place a mandate.

Thank you, Mr. Chairman.

Mr. DUNCAN. Very good point, Mr. Miller.

Mrs. Schmidt.

Mrs. SCHMIDT. Yes, I have a question for you, Ms. Pogue. I am sorry I am late, I had to vote on another bill. But I was reading some of the remarks that you had at the end of your testimony. They are pretty extensive in which you would like to see included in the language of the bill.

Have you had a cost assessment of some of these as well as a property assessment of some of these requirements that you would like to see added to the bill?

Ms. POGUE. I am sorry, could you be more specific in terms of what in particular?

Mrs. SCHMIDT. Let me go back and look. Page 9 of 10, Section 7. You want us to consider delaying the legislation to set up a national levee safety program until the inventory is completed in three years, whereupon added data is available to design such a program, if included. You recommend adding after economically, socially and environmentally, you add and to build public awareness of the risks and to build the State capacity for levee safety programs.

I just want to know, in wordsmithing such as this, there is usually a cost attached to these things. Have you done a cost analysis of what this would add to the burden of the Federal Government?

Ms. POGUE. No, I have not. It is difficult to do a cost analysis which is why I think what we have said, in agreement with everybody else on the panel, it is difficult to try to quantify the magnitude of the problem when we don't even know the size of the problem, because we don't know how many levees are out there, what condition they are in or so forth. Which is why under Section 7 in that paragraph, the emphasis really is on getting the inventory competed, not only the inventory in terms of the number and location, but also the actual risk, how much risk this is posing to this many people. Then you can start working with costs to try to determine what this is going to cost.

Mrs. SCHMIDT. I don't have any other questions at this time, thank you.

Mr. DUNCAN. Thank you very much, Ms. Schmidt.

Mr. Shuster.

Mr. SHUSTER. Thank you, Mr. Chairman.

Another cost question. I think, Ms. Pogue, you are absolutely right, we have to figure out what the inventory is and the condition of it as we move forward or we are never going to know exactly what it is. I think Mrs. Schmidt, your question is—that is an appropriate question and that is why I guess we are really trying to get to the bottom of it.

In the levee safety bill, do you think that there needs to be, we need to strengthen the section concerning cost benefit analysis? Where do we build a levee? You mentioned, Ms. Pogue, that we shouldn't be building them in undeveloped areas. But are there places that there are levees today that we should look at and say, and there is mitigation, move people out, they have done that in my hometown of Altoona, Pennsylvania. There is a floodplain there and we finally got eight houses, we have given them the money and they have moved out.

So should we strengthen the cost benefit analysis so that when we are deciding to strengthen levees we ought to be making that assessment?

Ms. POGUE. I think that is why there were suggestions made in there in terms of socially and economically and so forth. When levees were built, and again this gets back to the inventory and knowing what design standard it is, and what the risk is that that par-

ticular levee poses, when we target, if you will, certain levees, we are talking about those that are high risk and medium risk, and why? Because as you are saying, those are the ones that were built, maybe not to an adequate standards, but subsequently, a lot of development occurred on the other side of the levee, which probably wasn't intentioned when the levee was originally built.

So I think when you are looking at socioeconomic factors, and I think Mr. Rabbon talked about, and perhaps Dr. Nicholson, about how with the Army Corps guidance in terms of looking at a cost benefit analysis, we sort of need to add two things in there, and that is public safety, health and welfare. And I think that hopefully will tip the cost benefit analysis.

Mr. SHUSTER. Right. General, your thoughts on cost benefit analysis?

General RILEY. Yes, sir, I clearly agree. Within our principles and guidelines, there remains a great deal of flexibility. A little more than a year ago, we published engineering regulations which descried that all of our planning studies will look at not just the national economic development, but also regional economics, environmental and what is categorized as other social effects, where loss of life would be a very important factor. So we are requiring all of our planning studies to look at all four of those accounts.

We state you must identify the national economic development alternative, but select that one which best meets the needs of the Nation. So we have already directed that those kinds of factors be considered. In our budgeting process as well, not just our planning process, but our budgeting process, risk to loss of life is also a factor in our budgeting.

Mr. SHUSTER. I saw in New Orleans, what the Chairman was saying about earlier, I am no engineer, but when I was in New Orleans, where the breach occurred, I don't know which one, maybe 17th Street, Canal Street, there were yards, the levees were part of people's yards. There were trees planted in it. Across the canal on the other side, there was an access road, a barrier, then the buildings started.

So again, from an amateur's eye or layman's eye, it just seemed obvious to me that that had to contribute to the failure of the levee, having the trees in people's back yards and other structures there.

In your analysis in New Orleans, I saw the breakdown where it was somewhere between $3.5 billion and $10 billion to raise the standards of the levees, but 8 percent of the population in some off those outlying parishes, about 8 percent, was going to cost $3 billion or $4 billion. My staff did a quick analysis that is $250,000 per person, man, woman and child. That just seems to me that if I lived there and somebody offered me, not $250,000, but some kind of money, they would grab it and run out of there, and we could use it for some other purpose.

The second question I have, have you learned anything from our international partners around the world? For instance, the Dutch, I know they build their levees to the 15,000 year floodplain, which I don't know who was around 15,000 years ago to be able to determine that. But what are your thoughts about that, General?

General RILEY. Yes, sir. We have the Dutch on our planning teams. We have them also on the forensics team, as well as the

Japanese, who have great experience in this. So we are clearly eager to accept any and all advice in our interagency performance evaluation team, which Dr. Nicholson is doing the external review on.

We have 50 different agencies and organizations represented in that. So we are serious about bringing in all the expertise we possibly can get.

Mr. SHUSTER. Do any of the rest of you care to comment on anything you have learned internationally from the Dutch or the Italians? Even the Russians in St. Petersburg have a significant concern up there, with that city.

Mr. NICHOLSON. Yes, as well, we have, in our assessment team, when we went to New Orleans, we had both Japanese and Dutch participation. And as well, we have Dutch participation on our review panel of the Corps' investigation.

Ms. POGUE. I will make one comment. In February I was invited as the chair of ASFPM to speak before the French Parliament. They had quite a gathering, over 200 people from around Europe. The one comment I will make, which is less on structural design and so forth, is more on the people's psyche. In those areas of the country, where they have been at this for a much longer time, there is just an absolute accepted practice of mitigation. It is just accepted, it is believed in, it is without question and it is looked upon as an investment rather than expense.

So I think it is sort of in people's behavior, it is much different over there in terms of they accept the risk and they know the risk and they are willing to do something about it.

Mr. SHUSTER. Is that the French or just Europeans in general? Or are you talking about the Dutch?

Ms. POGUE. Well, there was a Dutch panelist who advocated that, a German panelist and a French panelist, particularly in the Noire Valley and in those areas.

Mr. SHUSTER. Mitigation meaning moving people or building up stronger?

Ms. POGUE. Mitigation—exactly. Mitigation meaning moving people if need be, meaning elevating structures, meaning don't build there to begin with. Basically long term looks at reducing flood impacts.

Mr. SHUSTER. My time is up, so I will yield back, Mr. Chairman.

Mr. DUNCAN. Are you through, or did you want something else?

Mr. SHUSTER. I have another question if that is all right.

Mr. DUNCAN. Go right ahead.

Mr. SHUSTER. On the Dam Safety Bill, which the levee safety program is modeled after, could you comment on, I think Ms. Pogue, you mentioned there were some weaknesses in it. Could you all sort of comment on what you think the Dam Safety Bill needs to strengthen, as well as, I think you touched on the Dam Safety Bill, $10 million is not enough? I think you are right.

Ms. POGUE. The Dam Safety Bill, first of all, thank God, they did it when they did it. I will say, if not for that bill and that program, Rhode Island would never have figured out how many dams we have and how many are at risk and how many are categorized. So it is a great starting point.

The disconnect, however, is that dams are built or dams are taken down and there is no sort of, and the General referred to it in sort of a watershed concept in terms of planning and management, looking at that more holistic approach.

So unfortunately, I think what is happening, at least in our State, and many States with the Dam Safety Bill, is they are not incorporating floodplain management principles when dams are built or taken down or so forth, or when there is development on the other side of a dam or as a levee. So I think the point we are trying to make is start with that, but then you really need to incorporate the principles of floodplain management into levee design and safety.

Mr. SHUSTER. Anybody else?

Mr. RABBON. One very short comment, which I think we need to pay attention to, because of what we have here, California has an outstanding dam safety program. It was because there was a dam failure and people lost their lives.

Mr. SHUSTER. My district does not have Johnstown, Pennsylvania, but I live about 35 miles from there and over 2,000 people in the late 1800s were killed because that dam was not properly constructed.

Anybody else care to comment?

General RILEY. Sir, the only comment I would make, not on the Act itself, but on the implementation, the Corps does have the authority in that Act to inspect any dam, regardless of Federal or not. We have not done that, primarily one, we would want the States to request our assistance, and when they do that, then we assist. Nor is there any general funding to do that.

The other piece is the upgraded data base, geospatial data base, it would be best to use it for that, too. Of course, we have that technology now. Not the funding to do that, but that is one of those things that we could do better in the implementation.

Mr. DUNCAN. Mr. Shuster, thank you very much. I think we are getting close to some votes. Mr. Taylor has a couple of follow-up questions.

Mr. TAYLOR. Thank you, Mr. Chairman.

General, and again, I don't want to cast aspersions on the efforts of this bill, because it is certainly a noble cause. My question is the difference between identifying problems and fixing problems. And I guess the for instance I would like to use is, what was the dollar amount of levees that the Corps had identified prior to August 1 of 2005 that became in effect an unfunded requirement to be fixed, just in the New Orleans area? Could you give me an idea?

General RILEY. No, sir, I don't think I could right now. I would have to take that one for the record. Would you please? Because the one that sticks out in my mind is I remember going all the way back to 1971, the Coast Guard at New Orleans being told they were going to move their base so the Industrial Canal locks, which were getting ready to fail in 1971, could be moved. It is now 2005, and if my memory serves me right, those Industrial Canal locks are still sitting in the exact same place.

So that is just one for instance of what I guess is going to be a billion, multi-billion dollar tab of things you had identified prior to the storm that needed to be fixed, but for lack of funding didn't.

And again, so I guess I just want to point out that it is pretty easy to identify problems. The hard part for this Congress has been coming up with the funds to fix those things once you identify that. But I really would like to have that for the record.

Thank you, Mr. Chairman.

Mr. DUNCAN. I thank you very much, Mr. Taylor. Certainly you are correct about that.

Dr. Ehlers.

Mr. EHLERS. Thank you, Mr. Chairman. I really have no questions, because I am hopping between three subcommittee meetings. But as a scientist, I am fascinated with this topic. I appreciate the evidence you brought, and I appreciate your holding the hearing, Mr. Chairman. With that, I will yield back.

Mr. DUNCAN. Thank you very much.

Ms. Johnson.

Ms. JOHNSON. Thank you very much, Mr. Chairman. To the panelists, in most of today's testimony, there is general criticism that the funding levels in H.R. 4650 are insufficient to meet the need. So what would each of you suggest would be a more appropriate level of funding for the scope of levees included?

Mr. NICHOLSON. I will go ahead and speak. As you mentioned, my spoken testimony here, we suggested approximately doubling the appropriations amount, essentially front-end loading that for the inventory, which has to be the starting point of this. So essentially put that $20 million a year for the first three years to get that inventory done. Before we have that inventory, we don't really know where to go.

Ms. POGUE. I think at this point, we had gone somewhere between—I feel like I am playing with monopoly money, doubling or tripling, but the point being, as Dr. Nicholson is saying, it does need to be front-end loaded, so that you can get the inventory started and start to get an idea of what the magnitude of the problem is, as I had mentioned.

Mr. RABBON. NAFSMA does not have a recommendation for the additional amount of funding, but we do concur the first step must be the levee inventory. And after that, I think it would be easier to propose a number.

General RILEY. Yes, ma'am, our planning right now, of course we have $30 million that you provided last December, $20 million in our 2007 budget. It looks to get through our phasing of the inventories over the period of the next three years we would need about $20 million a year, which would be inclusive of that that's already been either provided or in our budget.

Now, to move on to an assessment phase, that is a different story, which we really don't have a true estimate. The bill asks us to develop the methodology to do that assessment. So we are in the process of doing that now.

Ms. JOHNSON. Thank you very much to the witnesses. Thank you, Mr. Chairman.

Mr. DUNCAN. Thank you.

Dr. Boozman.

Mr. BOOZMAN. Thank you, Mr. Chairman.

As you know, FEMA and the Corps are placing a lot of scrutiny on levees throughout the Country, including in my district. Is it

possible to investigate the integrity of the levees in a satisfactory way without requiring outright certification?

My second question is, should there be different requirements concerning Federal versus non-Federal. What is your thinking on those questions?

General RILEY. Sir, if I could address the first one, there is, of course, a FEMA requirement for certification for those levees in the National Flood Insurance Program. We certify that both structurally and in the hydrology, we would have to model the 100 year storm to go through there and see how that would respond, and determine the appropriate height.

You separate that now from your structural question, and it is certainly possible to structurally determine the capability of a levee to determine, and its capability to withstand a certain year of floods. So we could determine the assessment of a levee, whether it is a 20 year storm of 50 year storm or 100 or 200. Separate from the FEMA's national flood insurance program.

Mr. BOOZMAN. How about the Federal versus the non-Federal, different standards.

General RILEY. Sir, the standards ought to be the same. There is no question. And there are different categories, and the data base will have all the different categories, but certainly standards ought to be the same.

Mr. BOOZMAN. Government has a tendency to overreact sometimes when major events occur and that's not to suggest that what we're talking about is inappropriate. I am very supportive of the Chairman.

Along those same lines, regarding the FEMA mapping, I know there is some talk of areas in Arkansas that might get remapped in such a way that would cause problems with regard to the current usage, where we've never had any problems. What is your feeling? Do you feel like there is a tendency to overreact in this area?

General RILEY. Sir, the Administration has proposed a national levee inventory in its budget for next year. So that is our proposal. So we don't think it is an overreaction. We think it makes eminent sense to have that inventory to know what we have out there and then to allow us then to focus on the assessments on the most critical ones.

Mr. BOOZMAN. Thank you, Mr. Chairman.

Mr. DUNCAN. Thank you, Dr. Boozman.

General Riley, I am not sure I was understood or was clear a while ago about, or that it was clear to me what you said about where you stand now with the $30 million that was in the supplemental. I thought I heard you say something about three years time. Where are you?

General RILEY. Sir, right now—

Mr. DUNCAN. People make comments to me throughout the hearing and sometimes I miss part of the answers. What did you say?

General RILEY. In our inventory, we have got the four phases planned in our inventory, Mr. Chairman. Phase one is to begin that geospatial data base, and then phase two, begin to debate against that, phase three, by the end of 2000 [sic], then incorporate and re-

fine the data base and bring in all the Federal and non-Federal levees into the data base.

That, by the end of next year, up to about $40 million to do that, those two pieces. And then another, phase four, when you complete this detailed inventory, another $20 million to $40 million. So that is what I was saying is, with the $30 million appropriated, the $20 million in our budget, that will be necessary to get this moving and it will get it off to a great start for the next two years. What we would need probably to complete that is about $20 million a year for the following two years.

Mr. DUNCAN. So if I understood you correctly, it would take you about four years from now to complete the inventory?

General RILEY. Yes, sir.

Mr. DUNCAN. Okay.

And Mr. Rabbon, can you tell us where you stand? We have been hearing and reading about all the rains in the Sacramento area and so forth. I know that you have, or the State of California has declared an emergency regarding their levees. I am told that you are in the process of repairing 24 critical levees. Are most of those in that area that we are hearing about? Or what is the situation?

General RILEY. Yes.

Mr. DUNCAN. You are going to complete that by the end of this year, is that correct?

Mr. RABBON. The intent is for the State of California and the Corps of Engineers to complete construction on the 24 critical erosion sites. And those have been identified primarily because the levees that we are looking at protect highly urbanized areas. We actually have over 180 erosion sites throughout the Sacramento River flood control system.

Mr. DUNCAN. All right. Well, we are getting into these votes now. Let me just, I am not going to be able to ask all these questions. But I do want to ask one of Ms. Pogue and Dr. Nicholson, separate questions. Ms. Pogue, in your testimony, you suggest that the Federal Government, including the Corps of Engineers, should not be performing the detailed engineering assessments for non-Federal levees. Who should be responsible, and why do you say that or suggest that?

Ms. POGUE. I think again that gets back to what Representative Boustany brought up, and that is that it is a Federal, State and local problem. It needs to be shared. I think when those levees are regionally owned, county owned or local or State owned, they bear the burden of trying to have those engineered and surveyed.

So it is either going to be engineering staff on State departments, which we don't have in Rhode Island, so it is basically the private sector, private engineers. But I think that burden again goes back to the States and goes back to the local governments to bear that brunt.

Mr. DUNCAN. Well, on most things, we find that the private sector, and then the local and State governments can do things a little more cheaply and economically than the Federal Government. Do you find that also?

Ms. POGUE. Not only do I agree with that, but I think also often, more expeditiously as well.

Mr. DUNCAN. All right. Dr. Nicholson, you suggest setting up a system of independent peer reviews on all these federally funded levee projects. We have added some of that for the bigger projects into the WRDA bill that we passed. Why do you think that is important, and how much do you think something like that would cost? Do you have any rough guess?

Mr. NICHOLSON. No, I don't have an estimate on the costs associated. But what we find is that in most cases, certainly for large dams, even if those are constructed by Federal agencies, those will most often have an external peer review. Because there is no one single, even though there may be a standard, every dam is going to be different, the levees now in the same way that dams may be protecting or providing flood mitigation for urbanized areas.

Mr. DUNCAN. Well, the problem I see, already they are talking about $60,000 per mile for just the assessment phase. If you start adding in all kinds of extra things already, then I just don't, it is just like talking about the Dutch. We certainly want to use their expertise and their suggestions. But we are so much bigger, that we can't really do exactly what they have done all over this Country without spending our entire Federal budget on some of these things. So that is the problem, I think.

Mr. NICHOLSON. I don't think really it is a whole lot of extras. Having an external peer review is not necessarily going to have near the cost of doing the evaluations. When we talk about the costs of actually doing evaluations or assessments of these embankments—

Mr. DUNCAN. Sir, I tell you what. If we are going to take your suggestion seriously, though, why don't you send us an estimate specifically, as specific and detailed as possible, as to how much that would cost and how much time it would add to the process, okay?

Mr. NICHOLSON. We could look into that, sure.

Mr. DUNCAN. Okay. Thank you very much. I appreciate the testimony and the answers of all the witnesses. This has been a very good panel. Thank you very much, and that will conclude this hearing.

[Whereupon, at 11:40 a.m., the committee was adjourned.]

Congressman Russ Carnahan (D-MO)
House Transportation Committee
Subcommittee on Water Resources & Environment
Hearing on H.R. 4650, The National Levee Safety Program Act
Opening Statement
April 6, 2006

- Thank you, Mr. Chairman, for scheduling this hearing on H.R. 4650, the National Levee Safety Program Act.

- The lessons of the 2005 hurricanes have taught us the importance of flood protection, and particularly the importance of levees. When flood protection fails, the consequences can be catastrophic.

- Many portions of my own Congressional District in Missouri lie in a flood plain. These communities depend on flood protection, including levees, to keep them safe in the event of a flood disaster.

- I applaud the Committee, especially Chairman Duncan and Ranking Member Johnson, for its leadership in introducing the National Levee Safety Program Act. The reforms in this bill--especially those that authorize the U.S. Army Corps of Engineers to compile a comprehensive inventory of levees in the United States--will greatly improve the effectivness of flood protection in this country.

- These reforms will also help make communities vulnerable to flooding, like those in my Congressional district, much safer.

- I look forward to hearing the testimony of the witnesses today and to working with the subcommittee on this issue.

- Thank you.

STATEMENT OF
THE HONORABLE JERRY F. COSTELLO
SUBCOMMITTEE ON WATER RESOURCES AND ENVIRONMENT
HEARING ON HR 4650, THE NATIONAL LEVEE SAFETY PROGRAM ACT
THURSDAY APRIL 6, 2006.

Thank you, Mr. Chairman, for holding today's hearing on the HR 4650, the National Levee Safety Program Act.

The events in the Gulf Coast have brought considerable attention to the importance of levees and the proper maintenance of such infrastructure. Many other cities outside of New Orleans, such as St. Louis, face similar risk to flooding.

For example, in my congressional district there are significant components of the Wood River Levee which are aging and failing, with the system needing over $23 million in repairs and improvements. The levee was built in the 1950s and its 26 miles of walls protect 13,700 acres of land in Alton, East Alton, Wood River, Roxana, South Roxana and Hartford against possible flooding from the Mississippi River. According to a corps study, a levee failure could cost more than $3 billion in economic and environmental damages. I am working with federal and local officials

because the potential for a levee failure is a major problem that is growing more severe each day.

Another example near my district is the 10.9 mile levee protecting the City of St. Louis. The flood wall design of 50 years ago had mistakes which became clear in the flood of 1993 when water seeped under parts of the ten mile flood wall and further weakened the levee. Further, studies completed in 2005 indicate the flood gates are corroding. Many have estimated that if the flood of 93 happened again there is over a 90 percent probability that some component would fail.

Mr. Chairman, because of what happened in New Orleans and the potential for failure in and around my district, I am interested in hearing from our witnesses their thoughts regarding HR 4650 and levee safety overall. Little is known about the current condition of our entire levee system and that needs to change so that we can make sound decisions when putting federal, state, and local money towards these projects.

I look forward to today's testimony.

STATEMENT OF
THE HONORABLE EDDIE BERNICE JOHNSON
SUBCOMMITTEE ON WATER RESOURCES AND ENVIRONMENT
H.R. 4650, THE NATIONAL LEVEE SAFETY PROGRAM ACT
APRIL 6, 2006

Thank you, Mr. Chairman, for holding today's hearing on an issue of tremendous importance to our communities – the condition of our nation's flood control infrastructure.

In the aftermath of the 2005 hurricane season, the American public has, again, focused on the importance of adequately designed, constructed, and maintained flood control infrastructure in protecting lives and livelihoods.

The images of flooded streets, homes, and businesses, as well as the thousands of displaced families have, again, brought home the message that we cannot take our nation's infrastructure for granted – the consequence of failure is far too great.

In the weeks and months that followed Hurricanes Katrina and Rita, numerous communities throughout the country started asking questions about their own disaster response plans, including their potential vulnerability to flooding.

Unfortunately, one lesson learned from this exercise was that no single entity could quantify the nation's risk of flooding, in part, because no single entity has ever conducted a nationwide assessment of the adequacy of our flood control infrastructure.

In fact, no single entity even knows where all of the flood control infrastructure is located, let alone its condition.

In response to this need, Chairman Duncan and I introduced H.R. 4650, the National Levee Safety Program Act.

This legislation represents the first step in a larger effort to locate and assess the condition of the nation's flood control infrastructure, and to develop uniform guidelines for levee safety.

However, this legislative proposal takes only the smallest of steps in addressing the larger issues of assessment, adequacy, or proper maintenance of flood control infrastructure.

Mr. Chairman, last year, the American Society of Civil Engineers (ASCE) released its fifth "report card" on the condition of the nation's infrastructure. On average, ASCE gave the nation a "D" grade, and estimated that more than $1 trillion would be needed to address the backlog of maintenance and required infrastructure upgrades.

Unfortunately, this "report card" did not, or was not able to, include an assessment of the nation's flood control infrastructure, other than dams.

Yet, in spite of the obvious need for increased spending on infrastructure, the Administration and the Republican-led Congress have proposed cutting funding for both the Corps' construction and operation and maintenance activities – further perpetuating the backlog of necessary work on flood control protections.

Although, I am pleased to work with the Chairman on this legislation to identify, and hopefully one day assess and improve the condition of the nation's flood control infrastructure, I remain concerned whether we will take the next steps in ensuring adequate protections for our citizens' lives and livelihoods.

Once we know where the problems are, will we have the fortitude to ensure that potential gaps in the nation's flood control infrastructure are addressed?

Again, I thank the Chairman for holding this hearing, and I look forward to hearing our witnesses' testimony.

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H.R. 4650, the National Levee Safety Program Act

Testimony of

Peter Nicholson, Ph.D., P.E., M.ASCE

Associate Professor of Civil and Environmental Engineering
and Graduate Program Chair

University of Hawaii

On behalf of the

AMERICAN SOCIETY OF CIVIL ENGINEERS

Before the

Subcommittee on Water Resources and Environment

Committee on Transportation and Infrastructure

April 6, 2006

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Mr. Chairman and Members of the Subcommittee:

Good morning. My name is Peter G. Nicholson, and I am pleased to appear before you today to testify on behalf of the American Society of Civil Engineers[1] (ASCE) as you consider H.R. 4650, the National Levee Safety Program Act—legislation intended to improve the performance of levees throughout the United States.

I am a member of ASCE and the chair of the ASCE Geo-Institute's Committee on Embankments, Dams, and Slopes. In 2005, I assembled an independent team of experts to collect data and make observations necessary to carry out an assessment of the performance of the flood-control levees in New Orleans following Hurricane Katrina.[2]

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[1] ASCE, founded in 1852, is the country's oldest national civil engineering organization. It represents more than 139,000 civil engineers in private practice, government, industry, and academia who are dedicated to the advancement of the science and profession of civil engineering. ASCE is a 501(c) (3) non-profit educational and professional society.

[2] Hurricane Katrina was a catastrophic storm that made landfall in the Gulf Coast near the Louisiana and Mississippi border with wind speeds near 150 mph. Flooding, not high winds, was the principal cause of damage in New Orleans following the failure of numerous levees in and around the city. For an analysis of the hurricane and its impact on the levee system in New Orleans, see THE AMERICAN SOCIETY OF CIVIL ENGINEERS AND THE NATIONAL SCIENCE FOUNDATION, PRELIMINARY REPORT ON THE PERFORMANCE OF THE NEW ORLEANS LEVEE SYSTEMS IN HURRICANE KATRINA ON AUGUST 29, 2005 (Nov. 2, 2005) *at* http://www.asce.org/files/pdf/katrina/teamdatareport1121.pdf .

As engineers, our paramount concern is for the safety, health, and welfare of the public. We have learned a great deal from the tragedy of New Orleans, lessons that we hope will allow us to prevent future loss of life and property in Louisiana and elsewhere. We support federal, state, and local agency efforts to ensure that all infrastructure systems are (1) robust, i.e., strong enough and reliable enough to do the job; (2) contain redundant systems to prevent total system failure; and (3) are resilient enough to allow them to be quickly repaired when the inevitable failures within large, interdependent systems do occur.

Based on these basic engineering principles and our findings in New Orleans, we believe that Congress should enact H.R. 4650, with some modifications.

I. H.R. 4650, the National Levee Safety Program Act

The bill would require the U.S. Army Corps of Engineers to inspect levees in the United States for the purpose of protecting human life and property. It would require the Corps to check all levees built or maintained by the Corps of Engineers, and it would require federal inspections for any non-federal levee at the request of a state's governor.

Significantly, it would require inspections to determine whether a levee failure would constitute a danger to human life or property. These inspections would take into account a variety of possible failure modes, including disparities in floodwall height or construction materials, overtopping from storm surges, seepage, settlement, piping, sediment, cracking, earth movement, earthquakes, hurricanes, the failure of bulkheads or sheet walls, flashboards, gates or conduits, or "other conditions that exist or may occur in any area in the vicinity of a levee."[3]

The bill also would require the Corps to submit to Congress on August 1 each year a priority list of all future federally funded flood-damage-mitigation studies to be conducted based upon the levee inspections. The priority list would be based on the potential risk to human life or the environment if the flood-control project is not carried out, the benefits of protecting critical infrastructure and population centers, and federal guidelines relating to levee safety.

It would authorize—but not require—the Corps of Engineers to maintain "and periodically publish" an inventory of all levees in the United States, along with the results of levee inspections.

Other provisions of the bill would:

- Establish a nine-member National Levee Safety Review Board, to be composed of the Secretary of the Army; the Secretary of the Interior; the Administrator of EPA; the Director of FEMA; four representatives from state levee safety agencies appointed by the Secretary of the Army; and one representative from the private

[3] A number of these failure mechanisms have been noted in New Orleans. Especially marked was the subsidence of some levees by as much as three feet below their original design levels.

sector with expertise in levee safety appointed by the Secretary of the Army. Authorizes the Secretary of the Army to invite up to three nonvoting members to participate in the Board's activities, including a levee safety expert and a representative from any federal or state agency.

- Establish an Interagency Committee on Levee Safety, to be composed of the Secretary of the Army, the Secretary of Agriculture, the Secretary of the Interior, and the Director of FEMA, which would "support the establishment and maintenance of effective federal programs, policies, and guidelines to enhance levee safety for the protection of human life and property through coordination and information exchange among federal agencies concerning the implementation of federal guidelines relating to levee safety."

- Direct the Secretary of the Army to establish a national levee safety program. The program would be required have seven specific tasks, including the encouragement of the use of "acceptable engineering policies and procedures for levee site investigation, design, construction, operation, and maintenance, and emergency preparedness"; the development of technologically and economically feasible programs for hazard reduction; the creation of effective state levee safety programs; and the promotion of methods to provide technical assistance to the safety of nonfederal levees.

- Require the Corps, in consultation with the National Levee Safety Review Board, to establish federal guidelines for levee safety and direct the Corps to use "activities and practices" in use by the states, local governments, and the private sector in the development of the guidelines.

- Command the Corps to administer a program to assist states in creating and implementing levee safety programs. To qualify for federal aid, the state must have a Corps-sanctioned levee safety program in place that approves plans and specification for the construction or removal of levees; performs periodic inspections, requires inspections every five years for levees that may pose "a significant threat to human life and public property" in the event of a failure; requires all state inspections to be carried out by a licensed Professional Engineer; and provides money to assure timely repairs to these levees.

- Require the Corps to fund research into improved methods of rapidly building, repairing, and inspecting levees; the development of safety-monitoring equipment; the development of information systems to manage safety programs; and other policies aimed at "improvements to levee safety engineering, security, and management."

II. ASCE Policy Recommendations for H.R. 4650

We have several specific amendments to recommend to the Subcommittee.

Levee Inventory—The bill authorizes the Corps to maintain an inventory of levees at its discretion. The inventory should be compulsory. The Corps needs to account for every federal, state, local, and privately owned levee in the country. Without such an all-inclusive catalog, we run the risk of missing potentially life-threatening conditions at levees that are not accounted for by the government. The National Inventory of Dams, a data base of all dams in the United States maintained by the Corps, includes state and local government dams and privately owned dams as well. The levee system requires a correspondingly complete survey.

Levee Inspections—The bill would require the Corps to carry out a one-time inspection of every federally funded levee. The bill should be amended to require periodic levee inspections, as well as the identification and inspection of larger, interdependent flood- and storm-protection systems within which the federal levees function.

The bill does require states to carry out levee inspections at least once every five years for the levees posing the greatest danger to human life in order to receive assistance to support their levee programs. This provision is too limited. Every levee—whether owned by federal, state, or local agencies or by private citizens—that would pose a significant threat to human life and property in case of failure should be inventoried and inspected.[4] In addition, the law should contain a procedure for conducting more detailed and frequent safety inspections at the Corps' discretion.

Peer Reviews—ASCE strongly supports the use of independent project peer reviews for every new civil works project or significant modification to an existing system whenever any one of four key principles is implicated. Sound engineering principles require independent peer reviews by outside experts (1) when performance is critical to the public health, safety and welfare; (2) when reliability of performance under emergency conditions is critical; (3) when using innovative materials or techniques; or (4) when the project design is lacking in redundancy,[5] or the project has a unique construction sequencing or a short or overlapping design construction schedule. An independent project peer review should occur throughout the design process if any of these four principles applies to the levee project.

H.R. 4650 should be amended to require the Corps to establish independent peer reviews of all federally funded levee projects. Additionally, the Corps needs to ensure that independent peer reviews are conducted for every environmentally and economically significant levee project.

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[4] This category would consist of levees deemed to pose a "high hazard" in the event of a failure, a category that is comparable to the requirements for high-hazard dams under the National Dam Safety Act, 33 U.S.C. § 467 *et seq.*

[5] In engineering, "redundancy" refers to built-in failure-resistant systems to guard against the total design or operational failure of a civil works infrastructure project.

Vulnerability to Attacks—America's civil works infrastructure remains vulnerable to man-made attacks. H.R. 4650 should be amended to require the Corps to carry out a vulnerability risk assessment to determine which of America's major levees are susceptible to destruction by terrorists.

Because the precise scope of the nation's levee system is not known at this time, the Corps at a minimum should conduct an assessment of the vulnerability of each U.S. levee in urban areas to penetration by terrorists and criminals or terrorist attack in order to determine the potential threats to the levees protecting the greatest number of people. In carrying out assessments, the Corps needs to categorize the threat level of each major levee system as "high," "medium," "low." In addition, the Corps should set priorities based on the threat level and the vulnerability of each major levee system.

Appropriations— The bill authorizes Congress to appropriate $60 million ($10 million a year for the fiscal years 2007, 2008, 2009, 2010, 2011, and 2012) to carry out the Act, to be available until expended.

The appropriation level should be increased by $60 million (to $120 million over six years). We recommend a separate authorization of $20 million in fiscal years 2007, 2008, and 2009 to conduct the national levee inventory required under section 4. This would be in addition to the $10 million authorized in the original bill for other levee programs in the first three years. (The Bush administration has asked for $20 million for the levee inventory for one year in its FY 2007 budget request for the Corps.)

Moreover, ASCE believes the bill should be amended to authorize annual appropriations for the creation and maintenance of the levee safety program within the Corps of Engineers. We urge the Subcommittee to provide $7 million annually for state assistance to implement levee safety programs, $1 million annually for the maintenance of the national levee inventory, $1 million annually for the bill's research program on levee safety, and $1 million annually for levee safety training programs.

Thus, the funding authorizations should amount to $30 million annually in FY 2007-2009 ($90 million in the first three years) and $10 million annually in FY 2010-2012 ($30 million in the last three years).

Thank you, Mr. Chairman. That concludes my testimony. I would be pleased to answer any questions that your or the members of the Subcommittee may have.

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STATEMENT OF
THE HONORABLE JAMES L. OBERSTAR
SUBCOMMITTEE ON WATER RESOURCES AND ENVIRONMENT HEARING ON
H.R. 4650, THE NATIONAL LEVEE SAFETY PROGRAM ACT
APRIL 6, 2006

Mr. Chairman, our hearing today focuses on H.R. 4650, The National Levee Safety Program Act, which authorizes the Army Corps of Engineers to inspect levees that were constructed by the Corps, levees that are maintained by the Corps, and any levee identified by the Governor of a State. The bill authorizes the Corps to publish and maintain an inventory of levees in the United States and also issue guidelines relating to levee safety.

This bill is modeled after The National Dam Safety Program Act, which was enacted as part of the Water Resources Development Act of 1996 and was later amended by the Dam Safety and Security Act of 2002. The program was instituted to improve safety of and security around dams by providing grants to state dam safety agencies to assist them in improving regulatory programs, establishing training programs for dam safety inspectors, creating a National Inventory of Dams, and funding research to enhance technical expertise as dams are built and rehabilitated.

Dams were described "to be the federal government's darlings" in a January 2006 article in the New Orleans Times-Picayune, entitled "Too bad our levees get no dam respect." This bill begins to change that.

There has never been an inventory of the levees in this country. We lack an across-the-board sense of where the levees are located, what condition they are in, or what resources are at risk if one should fail or be overtopped. Creating such an inventory of the structures, along with inspecting them and completing geotechnical assessments of them, will be lengthy and expensive. We must determine the ownership of the structure, its age, and the type of property the structure is protecting.

Hurricane Katrina is estimated to be the costliest and most deadly hurricane in our nation's history. Prior to 2005, the most costly hurricane to strike the U.S. was Hurricane Andrew, which made landfall in southern Florida in 1992 and was estimated to cost $25 billion in damages. NOAA estimates that Katrina wreaked around $100 billion in damages. Much of these costs could be contributed to the flooding, and the resulting property damage, of large parts of New Orleans because of inadequate levees. A team of engineers studying the New Orleans flood protection system after Katrina noted that, "New Orleans levees were built using standards developed when they were meant to protect farmland, not millions of people and their property."

Similarly, the levees in use today in the Sacramento area, where I have family, are often the same levees built when farmers first began settling there in the mid-1800s. On Tuesday, two levees broke in the Central Valley, and homes were evacuated in San Francisco because of the threat of landslides. The heavy rain falling on Northern California for the past month is not expected to let up any time soon, heightening anxieties about the region's fragile levee system. Governor Arnold Schwarzenegger declared a state of emergency on February 24 for California's levee system. The Governor also requested President Bush declare California a federal state of emergency and assistance from the Corps in completing critical levee repair work.

The problems of the levee systems in New Orleans and Sacramento are only two examples of what could happen without the proper identification and maintenance of levees across the country. During the 20th century, floods were the number one natural disaster in terms of the number of lives lost and property damage. This bill is necessary to reinforce our flood protection system in order to reinforce protection of our nation's future health and welfare.

I welcome our witnesses here today and am eager to hear their testimony.

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TESTIMONY

Association of State Floodplain Managers, Inc.

before the
House Committee on Transportation and Infrastructure

The National Levee Safety Program Act of 2005
HR 4650

Presented by:
Pamela Mayer Pogue, CFM, Chair
State of Rhode Island
April 6, 2006

INTRODUCTION

The recent catastrophic disasters on the Gulf Coast and Florida, and the increasing flood damage elsewhere in the nation are reminders to the nation that we are susceptible to natural hazards – especially flooding – and that we must have programs, policies, and institutions that can adequately handle these events, efficiently use taxpayer money, and build a more sustainable future for our citizens. Nothing less than our nation's prosperity and viability are at stake. The Congress and this Committee will be at the epicenter of this discussion, with an opportunity to make policy changes that can have importance and relevance far into the future.

Make no mistake about it, the potential for levee failure with catastrophic consequences and human suffering is not just a New Orleans problem. The levees in California are a disaster waiting to happen, where the consequences could equal that of the New Orleans catastrophe. An added hazard for California involves the earthquake risk, which can cause failure of even good levees. Every state has levees, we just don't know where they all are, or the number of people and structures and critical facilities at risk behind them. Warning and evacuation of populations behind levees are a life safety issue that should be viewed as even more important than property damage. All of these consequences must be factored into a comprehensive levee safety program for the nation.

ASFPM appreciates the initiative of the committee, under the strong leadership of Chairman Duncan. **ASFPM supports HR 4650 in general, and provides suggestions on how we feel the bill might be strengthened.** We look forward to working with you to develop an effective approach to flood risk reduction. The ASFPM is also appreciative that the President's budget for FY 2007 contains $20 million for the Corps of Engineers to initiate a levee inventory, and this bill and our testimony will address effective approaches.

The Association of State Floodplain Managers, Inc. (ASFPM), and its 22 Chapters represent over 9,000 state and local officials and other professionals who are engaged in all aspects of flood loss reduction and floodplain management and hazard mitigation, including management, mapping, engineering, planning, community development, hydrology, forecasting, emergency response, water resources projects, and insurance. Many of our members work in communities impacted by hurricanes Katrina and Rita, or work with organizations that are assisting those communities to rebuild. All ASFPM members are concerned with working to reduce our nation's flood-related losses and in rebuilding a safer Gulf coast. Our state and local officials are the federal government's partners in implementing programs and working to achieve effectiveness in meeting our shared objectives of reducing the suffering and costs. For more information on the Association, please visit http://www.floods.org.

Thank you for inviting us to offer our views on the need for a levee inventory and levee safety program in the United States. The following testimony addresses:

A. Key provisions for Reducing Future Flood Damages caused when levees fail

B. A Reflection on the Early History of levees in the nation

C. The need for data showing where levees exist and the population that is at risk behind levees

D. The Consequences to the nation from a lack of a comprehensive approach to levee safety

E. General suggestions on HR 4650 language

Appendix---Specific suggestions on the language of HR 4650

A. BASIC PRINCIPLES FOR REDUCING FUTURE FLOOD DAMAGES CAUSED WHEN LEVEES FAIL

1. Congress should decide if this bill should focus first on an inventory of levees with a cursory assessment of risk for each and collect enough data to determine the magnitude of the problem. Subsequent legislation could then design a levee safety program based on the data. (see page 6)

2. The federal government (Corps of Engineers as lead) should develop the initial levee inventory in cooperation with states, who must collaborate with local and regional entities in their state.

3. Any long term levee program must use the states as a focal point, who must in turn involve regional and local related programs. States are the only entity that has inherent authority to regulate the design, construction, operation and maintenance of levees. The federal government can encourage those things and offer incentives, but cannot mandate them.

4. Incentives must be built into the program to encourage states to undertake levee safety programs. Monies that states spend on effective levee safety programs will result in reduced federal tax spending for disaster relief. Thus, incentives could consider that appropriate state expenses could be banked against the non federal share of future disaster costs in that state.

5. The levee database must be geo-spatial and organized in a way that various data can be pulled from it for an ongoing inventory and assessment of risk. It must also be compatible with and linked to other related geo-spatial databases like FEMA's map mod program and USGS data.

6. The levee inventory and any follow up assessment and levee safety program must be clearly coordinated with related mitigation programs of the Corps of Engineers and other federal agencies such as FEMA (HMGP, PDM and FMA), NRCS, Bureau of Reclamation, etc.

7. Safety standards for levee construction must be developed; **levee safety standards are related to but not the same as standards for flood insurance (FEMA) and economics (USACE's NED).** Safety of people and critical infrastructure are a separate issue from those. Guidance must be developed that establishes criteria and definitions for high, moderate and low risk levees in order to set priorities for the assessment and future mitigation actions (see page 5).

8. The federal government should not be performing detailed engineering analysis or designing engineering remedies for non-federal levees. That is the function of levee owners and sponsors. There is adequate expertise and capability in the private sector for non-federal levees.

9. Federal and State policy groups and Boards must be charged with recommending appropriate levee standards for various levees in the nation. The standard must be improved from the current 1% (100 year) standard currently used in most of the nation that is not providing an adequate standard of safety to protect highly urbanized areas and critical infrastructure.

10. ASFPM finds that future flood losses can be reduced if levees are never built to protect land that is undeveloped. Levees may be a viable option of last resort for mitigating damages to existing urbanized areas if properly designed, constructed, operated and maintained, but only if proper warning and evacuation procedures can assure protection of lives for those living at risk behind those levees.

B. A REFLECTION ON THE EARLY HISTORY OF LEVEES IN THE NATION

Levees have existed in this nation since early times. Those early levees were simply mounds of dirt thrown up by farmers or property owners to prevent frequent flooding of their property or crops. In California and elsewhere they may have been the mounds created by mining of river beds. Most of the population lived near rivers or the coast, since waterways were our highways and the rivers were our source of water for human and livestock consumption. The federal government got into the levee business in an organized way when Congress asked the Corps to become involved in the levees in Sacramento in 1917. The Flood Control Act of 1936 provided authority for the Corps of Engineers to be the lead agency on Flood Control projects in the nation. That authority has been used extensively for structural projects such as levees, dams and channelization, which modify our natural waterway systems to accommodate human needs. While the Corps has authority to also perform non-structural projects such as elevation and relocation of at risk buildings, the vast majority of projects have been structural (driven by an NED only policy). The evolution of responsibility for flooding and its consequences with a focus on federal structural projects has led states and communities to view flooding as a federal problem, not a state and local problem. It is important all federal legislation on levees establish a shared responsibility for damages when a levee fails, and for implementing a levee safety and mitigation approach.

Thousands of miles of levees have been constructed by the Corps, most with a non-federal sponsor that provides cost sharing for construction and accepts responsibility for operation and maintenance. The location of those levees is known to the Corps, although many of them may not be in a geo-spatial database. Many other levees have been constructed by communities or private individuals or levee groups. We know where some of these are, especially those who apply for and participate in the Corps PL 84-99 program, which allows federal tax money to be used to reconstruct the levees after failure or damage from a storm event. Many private levees were built to protect farmland from frequent flooding in order to make it economic to crop the land. Over time, development of homes or other buildings has taken place in the area which would be inundated when those levees overtop or fail. Many of the property owners behind those levees may not even be aware they are "protected" by a levee, and the condition of the levee may be known to no one.

Levees have been built to various heights to contain storms of various frequency. In the early years levees may have been built to withstand the Probable Maximum Flood, the 500 or 200 year flood, etc. In the past few decades most levees have been "dumbed down" to only withstand the 1% chance flood (100 year flood). That is an unintended consequence of combining the Corps NED policies with FEMA's policies that areas protected by the 100 year flood are not required to carry flood insurance nor are they required to be elevated or otherwise protected from flooding.

ASFPM recommends Levee safety standards for protection of urbanized areas and critical facilities like hospitals, emergency operation and shelters must be protected to at least the 0.2% (500 year) flood event and in coastal areas a category 5 storm surge.

ASFPM recommends all structures in areas subject to inundation when a levee fails be required to carry flood insurance.

C. THE NEED FOR DATA SHOWING WHERE LEVEES EXIST OR THE POPULATION AT RISK BEHIND LEVEES

Levees can be grouped in 4 groups:

1. Federally built and operated
2. Federally built and locally maintained
3. Locally built and locally maintained
4. Privately built and hopefully maintained

While information on the location of Corp of Engineers constructed levees (group 1) can be gathered readily, it is not in a geo-spatial database that can provide cumulative data such as miles of levee, condition of the levees, population at risk, etc. That data for the other classes of levees is more problematic, with data on even the location of private levees being almost non-existent.

Additional data on the adequacy of the levee for (1) hydraulic capability or flood control capacity (height to contain a certain level of storm) (2) structural stability (is it geo-technically sound and structurally stable during that storm event) is similar to the above. (3) Data on the population at risk when the levee overtops or floods or (4) the cost of the structures and infrastructure likely to be damaged is also not known to any reasonable extent. The concern is that without this data, the Congress, the agencies, the states and communities or the public has any idea of the magnitude of the problem.

ASFPM surveyed the states to determine if states had an inventory of levees in their state. Only 2 states have a geospatial data base of their levees, and less than a dozen have even a listing of levees within their states. Other data indicates less than half of the states currently have the authority to regulate levee design, construction or maintenance of levees.

ASFPM suggests there is a need to establish a 3 tiered levee classification system:

- **High Risk Levees**: Those levees where failure can result in loss of life and significant property damage or where critical facilities like hospitals, water treatment, etc are at risk when a levee fails.
- **Medium Risk Levees:** Levees where failure will result in damage to a limited number of non-residential structures and failure will not pose a threat to loss of life
- **Low risk levees**: Those levees where failure would result in flooding of property, but no structures and will not cause a threat to loss of life. This may be agricultural land only

This system could be used to determine which levees would be inspected initially (high and medium only) and the National Levee Safety Review Board and advisory committee should set design and construction standards over the next 12 months.

D. CONSEQUENCES TO THE NATION FROM THE LACK OF A COMPREHENSIVE APPROACH TO LEVEE SAFETY

We do not know the amount of population or structures at risk behind levees that would suffer damages or loss of life when those levees overtop or fail. We have no data on the population behind most of the levees in the nation, let alone how many of those people would be able to evacuate in the event that levee or floodwall overtops or fails---whether during a storm event or on a "sunny day" failure. Damage data on the cost of the structures or the infrastructure in those levee or floodwall inundation areas is needed in order to asses the exposure of the taxpayer funded Disaster programs for both property damage and infrastructure.

<u>What is the risk associated with each levee?</u> Risk is determined by multiplying the vulnerability of failure of the levee or floodwall times the consequences when that levee fails. Which of our levees is high risk, moderate risk or low risk? We need all these answers in order to proceed wisely. How do we convey the risk to those living at risk behind those levees. Almost universally, people at risk of flooding when a levee fails do not understand or know they are at risk. "Risk perception" is that they are "safe" once the levee is there. This poor risk perception happens when governments tell them the levee is "safe" without qualifying they really mean its only safe from certain events and is compounded when government tells them they do not need to buy flood insurance nor do they need to elevate or otherwise protect their homes or businesses.

Based on the data that a well designed levee inventory would produce Congress can ask the agencies to design levee safety programs that would prioritize the nation's efforts to protect people and property. Without it, the size of the problem and costs of future events like Katrina-Rita are not known. To start fixing the problem before we know the magnitude or cost of the problem would not be an efficient use of taxpayer dollars.

E. GENERAL SUGGESTIONS ON HR 4650

Our suggestions fall into the following general areas. Specific suggested language changes are listed in the attached appendix.

General comments:

- It seems the bill should focus on the following elements:
  - Have the Corps produce an inventory of all levees in the nation
    - Or initially at least the subset of levees posing risk to humans
  - Provide an assessment of the "general" condition of those levees
  - Provide the base data that can lead to a national "Levee Safety Program between States and Levee owners
- Levee Safety Program - ASFPM believes that a properly designed State levee safety program is appropriate. However, the program presented is patterned after State Dam safety initiatives and carries forward some of its inherent weaknesses into the proposed Levee Safety program. First, the proposed structure will create one more federal "stove pipe" in State Government. An inherent weakness in the Dam Safety legislation is that it becomes in essence a permit function, with little apparent federal interest as can be demonstrated by the Federal Dam Safety Program never finding a home at the Federal level. We are aware of one state that has proven that the separation between levee management and floodplain management has led to poor management in and around the levees. Within the past year, as the people in charge of levee safety made steps to integrate floodplain management and levee management, those decision makers were removed in favor of those that would opt to put hazardous development in and around marginal levees, perhaps in the hope the federal taxpayers would pay the costs of catastrophic levee failure. We believe that a State Levee Safety Program is integral to the State's Floodplain Management Program and merging them into a single program will buffer short term State and Local political agendas while best serving the Federal interest.
- Funding - $10 million a year will be inadequate for implementing a full levee safety program which must build capability in and provide incentives for states to develop levee safety programs.
- Engineering Studies - **This is a major problem**. The Federal government should not be in the business of performing engineering inspections and designing engineering remedies. There is ample expertise and capacity in the private sector to do this. Levee owners should be told they must hire an engineer to inspect the levee and design needed improvements. The Corps should be collecting data and doing a cursory inspection of levees to report on heights, general condition of levee and maintenance and to inform owners and the state of their findings. And this should only be done on those levees in the high and medium risk categories.

We do not believe the Corps has the authority to order owners to repair levees.
But States can do so---if they pass a law (or have one) to that effect.

CONCLUSION

The ASFPM has a mission to reduce the costs of flood damages in the nation, which prior to the 2004 and 2005 hurricane seasons exceeded $6 billion/year. Today, we once again stand at a crossroads – in the aftermath of a catastrophic flood disaster with an opportunity to refine our nation's policy for managing flood hazards. Thank you for the opportunity to provide our thoughts on these important issues. The ASFPM and its members look forward to working with you as we move towards a common goal of reducing flood losses.

For more information, please contact: Larry Larson, ASFPM Executive Director, (608) 274-0123, (larry@floods.org) or Pamela Pogue, ASFPM Chair, (401) 946-9996 (pam.pogue@ri.ngb.army.mil)

Appendix to ASFPM comments on HR 4650

SPECIFIC SUGGESTIONS ON THE LANGUAGE OF HR 4650

Section 3: Inspection of Levees

ASFPM suggests this section be renamed "Inventory of Levees"

Page 5, line 2--- add the word "location," in front of construction

Page 5, line 7---Inspection requirements?

This section seems somehow to not fit in. How this is really "Determination"? It would seem there are two reasons to "classify" levees. One is to determine which ones to inspect first; the other is to possibly set different design and construction standards in the future.

We suggest there is a need to establish a 3 tiered classification system, to start with

- **High Risk Levees**: Those levees where failure can result in loss of life and significant property damage
- **Medium Risk Levees:** Levees where failure will result in damage to a limited number of non-residential structures and failure will not pose a threat to loss of life
- **Low risk levees**: Those levees where failure would result in flooding of property, but no structures and will not cause a threat to loss of life. This may be agricultural land only

This system could be used to determine which levees would be inspected (high and medium only) and the levee Board and advisory committee should set design and construction standards over the next 12 months.

Nothing wrong with the list of how a levee could fail, but is that appropriate for law? What if one form of failure is left out? Seems like this detail may be best for rules

Page 5, line 14---add "flooding" after storm surges

Page 6, line 3---add "flood or" in front of storm surge

Page 6, line 15—delete all of (2) through line 8 page 7 regarding engineering studies
This is a major problem. The Federal government should not be in the business of performing engineering inspections and designing engineering remedies. There is ample expertise and capacity in the private sector to do this. Levee owners should be told they must hire an engineer to inspect the levee and design needed improvements. The Corps should be collecting data and doing a cursory inspection of levees to report on heights, general condition of levee and maintenance and to inform owners and the state of their findings. And this should only be done on those levees in the high and medium risk categories.

We do not believe the Corps has the authority to order owners to repair levees.
But States can do so---if they pass a law (or have one) to that effect.

Page 7 line 9—delete all of (f) through line4 page 8

Priority lists---general
The Corps already presents a list of projects every year. Some argue that it needs to have priorities nationwide. While this sounds like such a list, this seems to be a list only of levee projects. We oppose such a list, and oppose having this bill result in a list of levee projects nationwide. This bill should authorize a levee inventory and assessment only, not projects.

Section 4: National Levee Inventory

Page 8 line 5—delete this title and move the sentence to the above new section on inventory

Section 5: Interagency Committee on Levee Safety

Page 8, line 9—We recommend USGS and EPA be members of this committee. Both have critical roles to play in collecting data and setting national policy on levees

Section 6: National Levee Safety Review Board

Page 9 line 5—We agree with our colleagues in the National Association of Flood and Stormwater Management Agencies in recommending that local and regional government entities also be represented on this Board since many of the nation's levees are operated and maintained by them.

Section7: National Levee Safety Program

Consider delaying legislation to set up a national levee safety program until the inventory in completed in 3 years, whereupon added data is available to design such a program. If it is included in this legislation, ASFPM recommends the following:

Page 13, line 22—after economically, add "socially and environmentally"

Page 14, line 8—add after programs—"and to build public awareness of the risks associated with living in levee failure areas"

Page 14, line 8—add at end—"and build state capability for levee safety programs"

Page 17, line 11—Before "provide", add 'Require levee owners to"

We suggest (ii) and (i) be switched. The whole premise of this section should be that the owner must fix the problem. Where no owner can be found, or the owner is insolvent, the state should then step in and breach the levee so it will not be subject to failure. The state should never "repair" the levee unless it is a state owned levee.

Page 17, line 20—before "establish" add "Require levee owners to"

Page 18 top of page with i, ii and iii.
This is where the classification system could come into play. On iii, the word "necessary" should be changed to "critical" facility, where the definition would be consistent with Federal Executive Order 11988 on floodplain management.

Page 18, line7—after flooding add "including the costs and consequences thereof"

Page 19, line 10---this is where incentives for states need to be developed or states will not adopt levee s safety programs

Page 21, line25—add after rehabilitation "maintenance"

Page 16-21 State Levee Safety Program

The whole concept of states needing to be responsible for levee safety is exactly right. The federal government does not have authority to order owners to fix or maintain levees, but states can and do.

What will cause states to undertake a levee safety program? It makes sense to provide federal incentives to the states if they undertake an effective program.

The most effective incentives would be to provide states (and communities in that state in compliance) with an increased cost share for disaster assistance and flood mitigation projects from FEMA. Some might ask why incentives in a Corps run program would encourage activity in FEMA programs? We all agree the agencies must integrate their flood loss activities much better. The biggest cost savings to the federal government will be for disaster relief and post disaster mitigation. Those two costs can be reduced greatly if levees in the nation are in safe condition and maintained as such.

Without incentives, states will not adopt or effectively administer levee safety programs. We can see that an effective state levee safety program should result in an increase in the federal share of Public Assistance for disaster relief and for post-disaster mitigation of from 2 to 5%. It is currently 75/25 split most times. A list of state activities and requirements could be established which could be used to give a state more or less credit, depending on how many items on the list a state adequately performs.

NATIONAL ASSOCIATION OF FLOOD AND STORMWATER MANAGEMENT AGENCIES
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Testimony of the National Association of Flood
And Stormwater Management Agencies

Presented by Peter Rabbon, P.E.
Principal Engineer
California Department of Water Resources
President, NAFSMA

National Levee Safety Program Act

U.S. House of Representatives
Transportation and Infrastructure Committee

Water Resources and Environment Subcommittee
Rep. John Duncan, Chairman

April 6, 2006

I am very pleased to present this testimony on approaches to enhancing the Safety of levees in the United States on behalf of the National Association of Flood and Stormwater Management Agencies (NAFSMA).

Background on NAFSMA

NAFSMA is a national organization based in the nation's capital that represents more than 100 local and state flood and stormwater management agencies. Its members provide flood or storm water management to more than 76 million citizens. As a result, we have a strong interest in the issues the committee is discussing today.

The mission of the Association is to advocate public policy and encourage technologies in watershed management that focus on issues relating to flood protection, stormwater and floodplain management in order to enhance the ability of its members to protect lives, property, and economic activity from the adverse impacts of storm and flood waters. Many of NAFSMA's members are currently non-federal partners with the U.S. Army Corps of Engineers in water resources projects, including flood management and environmental restoration projects.

Formed in 1979, NAFSMA works closely with the Corps, as well as the Federal Emergency Management Agency and the U.S. Environmental Protection Agency to carry out its mission. NAFSMA members are on the front line protecting their communities from loss of life and property. Therefore, the organization is keenly aware that flood management is a wise and necessary investment required first to prevent loss of life and ensure the safety of our citizens and secondly, to prevent damages to peoples' homes and businesses and protect them from economic disruption. Flood management has proven to be a wise investment that pays for itself by preserving life and property, thereby reducing the probability of repeat requests for federal disaster assistance.

We appreciate the committee's interest in these critical issues and look forward to working with you to develop a wise and sustainable approach to protecting our citizens from the risk of flooding. We appreciate the committee's interest in safeguarding our citizens by adopting a national levee safety program.

The last six months have been devastating for the nation's Gulf Coast region and our members have discussed a number of approaches outlined below that we hope will be considered by Congress as it moves forward in response to the destruction and loss of life that occurred as a result of this year's devastating hurricanes and resulting floods and as you look at the critical questions of assessing risks to the nation from such massive flooding events. In my role as NAFSMA President, I was recently in New Orleans and witnessed the wide magnitude of the devastation caused by Hurricanes Katrina and Rita. As a resident of Sacramento who lives behind a levee, as past General Manager of the Reclamation Board of California, one of the first nonfederal flood control partners with the Corps of Engineers and as an employee of the State of California's Department of Water Resources, I am acutely aware of the need to assess and respond to needed improvements to our levee protection systems. In fact, the Governor declared a state of emergency on February 24, 2006 for the state's levee system.

NAFSMA is encouraged that the President's budget proposal includes funding for a national levee inventory initiative and we look forward to working with you and the Administration to implement this much-needed initiative.

We greatly appreciate the efforts by the committee to craft and introduce the National Levee Safety Act of 2005 and offer the following perspectives and recommendations that we hope will help to develop a solid and implementable program to address this aging infrastructure need across the nation.

National Inventory as a Necessary First Step

As we move forward with this legislative initiative it is important to first identify the areas currently protected by levees. At this point, there is no national inventory or database of levees and other flood control systems throughout the country. Identifying the universe of these protection systems across the county is a critical and mandatory first step toward assessing their condition and capacity and to identify what resources may be needed to deal with our existing and aging flood protection systems.

We would define these flood protection systems in the following three Categories:

Federally-Built and Operated Flood Management Systems
Federally-Built and Locally-Maintained Flood Management Systems
Locally-Built and Locally-Maintained Systems

It is the first category of federally-built and federally-maintained categories where the most information is readily available. This information could prove useful for not only the levees included in this group, but also to present some background on the potential state of other similarly aged and designed levees throughout the country.

In this second category of federally-built and locally-maintained levees, design and construction information is generally available as well as information on the contacts for maintaining these levees.

In this third category of locally-built and locally-maintained levees, we are expecting that additional outreach from the state or regional levels, potentially from the Corps of Engineers District Offices, will be needed to identify where all or even most of these systems exist. There also exists a fourth category that includes privately-built and privately-maintained systems. While this category may house far fewer systems, the impacts to the public could be as devastating as publicly-maintained systems.

The development of this database of all levee and structural flood control projects is desperately needed. At this point, there is no national database that exists to alert federal and local officials where potential problems may develop across the nation. While we have sophisticated weather monitoring systems that can predict a storm's path and its level of intensity, we simply don't have the data we need to accurately predict how our nation's flood management systems can respond to these threats. We need a levee database that identifies not only federally-owned and operated levees, but local levees and other flood control structures as well. Many of our communities, both large and small, depend on levees and other structural systems for flood protection that have been built solely by the locality or state and these structures are aging and are potentially in need of repair.

NAFSMA strongly supports the creation of a national levee inventory administered at the federal level, but developed with the input of local, state

and regional officials so that it can be structured in a way to best provide the information needed at all levels of government.

Assessing Levee Condition and Capacity

The next logical step in a Levee safety program is the assessment of levee condition and capacity. We need to distinguish between the inspections currently performed to verify maintenance of a levee and an engineering assessment of capacity and stability of a levee needed to verify expected performance. Absent an assessment, risks to the public cannot be understood. A levee can be perfectly well-maintained, yet still not provide the same performance as originally designed due to a variety of factors, including changed hydrologic and hydraulic conditions, unseen geotechnical problems or simply old design criteria.

Other Federal Agencies and Programs Need to be Linked

Working closely in recent years with the Federal Emergency Management Agency to develop and implement the agency's Map Modernization Initiative, it has become clear that a natural partnership exists between the FEMA Map Modernization Program and the Corps flood control mission. As a result of these efforts, it has become clear that a national inventory initiative is needed and that both agencies need to have a role in the program. NAFSMA strongly supports HR 4650's call for a national levee/flood management structure inventory to be initiated and maintained by the Corps of Engineers, but we believe that the FEMA map modernization program needs to be linked with this program.

As FEMA continues to move forward to upgrade the nation's flood maps, it is clear that the need to address levees and their impacts on the floodplains and localities mapped under this initiative must be linked. Much information can be gained through FEMA's map modernization initiative to populate a needed levee inventory database and results from levee assessments are needed to accurately update floodplain maps.

NAFSMA and the Association of State Floodplain Managers have worked with both the Corps and FEMA in recent months to identify the areas where partnerships between the agencies in the flood management area are possible and necessary to ensure our citizens are adequately protected from the risks

associated with flooding. These partnerships can make all levels of government more effective and efficient at protecting the public from floods.

Establishment of Levee Safety Program

While NAFSMA agrees that national levee safety program is needed, it is important to note that such a program does not currently exist at the state level. HR 4650 seems to imply that states are already tasked with this charge and that levee safety agencies and programs exist at the state level. Since many of these projects are maintained at the local or regional levels, states have not been charged with responsibility for such a program.

Due to the way that Corps projects are structured, in most cases the nonfederal sponsor is a local agency that, at least since 1986, has cost shared part of the project. These local governments have taken on the responsibility for these projects including maintenance as defined in the operations and maintenance manual provided to non-federal sponsors upon transfer of the project.

For projects not federally authorized through the Corps a federal linkage generally does not exist and knowledge of the levee may only be housed at a local or special district level. Presently, there appear to be no clear lines of regulatory authority that would require locally constructed levees to be part of a state regulated program. For states, or regional entities, to establish and assume some type of safety or regulatory program, resources and incentives need to be provided.

Adequate Funding Is Critical

The $10 million per year in funding requested under HR 4650 is much too low to undertake a national inventory and assessment program, much less to address the next steps of repair or other additional work that will be identified in this effort. As the flooding in the Gulf has shown us, we do need to make a significant investment to avoid loss of life from levee overtopping or failures in the future.

In California we are planning to spend $2.5 million over a period of five years to develop a levee data base system that can be used for Corps, FEMA, State, and local purposes. This funding will also allow us to identify all the levees within the State and populate the data base with available data. To

date we have found over 12,000 miles of terrain that can be classified as levees of which only 2000 miles are federally authorized.

Local and Regional Involvement in National Levee Safety Is Critical

As outlined under HR 4650, the National Levee Safety Review Board is composed of 10 members, none of which are local or regional representatives, the levels of government where much of the responsibility for operating and maintaining flood control projects exists. The bill instead calls for four representatives of State levee safety agencies to be involved, entities which at this point do not exist.

NAFSMA urges that representatives from local governments and regional flood control districts be included on a National Levee Safety Review Board if it is created.

Re-Examination of our Prioritization for Funding Flood Control Projects

In closing, we very much appreciate the committee's efforts to draft this levee safety bill and look forward to working with you on the details of such an initiative. We do, however, want to stress that in the past few years, more and more emphasis has been placed on achieving the best economic value for federal involvement in flood management projects. We ask that the Principles and Guidelines for Corps of Engineers flood management projects be reviewed with an eye toward protecting lives and public safety first. We need to dedicate federal resources to the critical issues of first defining and making citizens aware of the risks associated with living in flood-prone areas.

While our members are committed, as you are at the federal level, to ensuring that the taxpayer receives the best possible reward for dollars spent on flood management, we also feel that we need to assess the risk faced by some of the nation's urban areas due to aging infrastructure issues. We are currently driven by a benefit cost analysis that does not adequately address the human risk factor in its formula. With these issues driving our allocation process for federal dollars, the nation's flood management agencies are put at a disadvantage in trying to work with the federal government to meet the nation's flood management needs.

We need to develop a resource allocation system that adequately addresses the risks to our nation's urban populations from flooding. NAFSMA is supportive of a national levee/flood control project inventory and assessment as a critical first step to addressing our nation's aging flood management infrastructure needs. Throughout the United States, densely populated urban areas have been protected by flood control infrastructure, which is now aging. Given the large number of lives at stake and the substantial fiscal consequences, there is a strong Federal interest in ensuring that measures are taken to minimize the risks to the population associated with extreme flood events.

Currently, however, public safety is not adequately accounted for in the prioritization of investments in federally-partnered flood management projects. The benefit-cost analysis that serves as the primary criteria for flood management investments at the federal level does not account for public safety. Instead, it focuses exclusively on the economic benefits of protecting properties and public infrastructure.

Let's develop a set of performance measures which encourages reduction in risk to our citizens from catastrophic flooding. Reducing these risks provides strong economic benefits. The amount of funding needed to address the damages, recovery and rebuilding efforts on the Gulf Coast should be strong evidence that this nation needs to commit more federal dollars to needed flood management efforts.

Other federal agencies, such as the Federal Emergency Management Agency, also need to have a role in such an effort. We know that the problems this country is facing as a result of aging infrastructure in the flood management area are real and that such an assessment is needed. We stand ready to assist in developing and implementing such an approach.

Creation of Flood Management Technical Advisory Committee

NAFSMA strongly supports the creation of a National Technical Advisory Committee on Flood Management. Our members feel that the lead federal agencies in this effort should be the U.S. Army Corps of Engineers, the Federal Emergency Management Agency, the Natural Resources Conservation Service, and the Department of Interior's Bureau of Reclamation. Also participating in this committee should be representatives of the U.S. Environmental Protection Agency and the U.S. Geological

Survey, as well as State and local representatives with expertise in flood and stormwater management, as well as local and State emergency response officials.

We believe this could easily be accomplished within this legislation by broadening the scope of the levee safety review board and committee. We would like to see the missions of this group include a focus on the facilitation and coordination of federal policies and programs related to flood management. It would be extremely helpful if this group could develop joint policy recommendations that could be considered by the administration for future flood prevention, response and recovery planning.

Other Issues

Although the following issues are outside of the purview of this Subcommittee, NAFSMA believes that they are important components of a unified national response to the recent disasters.

Removal of FEMA from the Department of Homeland Security

NAFSMA would like to raise the need to move the Federal Emergency Management Agency outside of the structure of the larger Homeland Security Administration. We have been concerned that FEMA would inevitably lose its needed independent ability to mitigate against and quickly respond to natural disasters in such a large agency as the Department of Homeland Security. While NAFSMA strongly supports the creation and the needed work of DHS, we feel that an agency with a primary focus on natural disasters is needed.

Continue Adequate Funding of FEMA's Map Modernization Program

Accurate Flood Insurance Rate Maps are an essential part of a comprehensive national floodplain management plan. To ensure that these maps are available to all levels of government as soon as possible, NAFSMA strongly supports continued adequate funding of FEMA's Map Modernization Program.

Mitigation Activities

The FY03 budget for FEMA reduced the Hazard Mitigation Grant Program

(HMGP), which is used for post-disaster mitigation, from the previously authorized 15% of disaster relief funds to 7.5%, and also established a competitive pre-disaster mitigation grant program. NAFSMA believes that the HMGP authorization should be returned to 15%, and that both pre- and post-disaster mitigation should be adequately funded.

In closing, NAFSMA very much appreciates the opportunity to present our thoughts on these critical national issues to the Subcommittee for consideration. We stand ready to work with you on these important issues and would welcome any of your questions.

COMPLETE STATEMENT OF

Major General Don T. Riley
DIRECTOR, CIVIL WORKS
U.S. ARMY CORPS OF ENGINEERS

DEPARTMENT OF THE ARMY

BEFORE THE

Subcommittee on Water Resources and Environment
Committee on Transportation and Infrastructure
UNITED STATES HOUSE OF REPRESENTATIVES

April 6, 2006

Introduction

I am Major General Don T. Riley, Director of Civil Works, U.S. Army Corps of Engineers. I am pleased to be here today and to have the opportunity to speak to you about the National Levee Inventory and Technical Assessment Program. My testimony today will provide a brief background and update the Committee on progress made to date by the Corps of Engineers in the development of a National Levee Inventory.

Background

Since the early days of the country and probably well before then, people have attempted to confine floodwaters to watercourses by constructing levees, which are earthen embankments designed to allow water to rise to a certain point above stream bank without overflowing. Federal involvement in flood damage reduction began with the construction of levees, channel work, and dams, all of which are structural solutions. More recently, we have begun to recognize that the best way to reduce our vulnerability to damages in many cases is through effective floodplain management, which involves striking a balance between human and natural uses of floodplains. This recognition has led to an increased emphasis on the development and implementation of non-structural approaches to flood damage reduction. Despite this trend, a large number of structures exist throughout the country. Nearly 9,000 miles of levees have been constructed by the Corps of Engineers alone. This accounts for only a portion of the total number of

structures protecting communities. Currently there is no database or single source of information concerning these structures.

Through the Inspection of Completed Works (ICW) and the Rehabilitation and Inspection Program (RIP), the Corps of Engineers performs inspections of flood damage reduction projects, including (a) projects federally built and maintained, (b) projects federally built and locally maintained, and (c) those projects locally built and maintained to determine eligibility for inclusion in the RIP or to determine eligibility to remain in the RIP. In most cases, maintenance of levees is a local responsibility with oversight provided by the Corps Inspection Program. Levee owners have an incentive to maintain levees in a sound condition to remain in the program and receive rehabilitation assistance after flood events. Additionally, the failure to maintain a levee in sound condition may result in withdrawal of Corps certification that it meets the Federal Emergency Management Agency (FEMA) Base-flood requirement. We should note these inspections are visual verifications of the local entity's compliance with the Operation and Maintenance Manuals and do not include the engineering assessments needed to verify project performance or stability. Results of the inspections are forwarded to the local entity with recommendations for correcting any deficiencies identified.

Recent surveys and events have indicated that some levees protecting populated areas may not provide the expected level of protection during flood events due to poor maintenance, deterioration from natural aging, changed hydrologic conditions or other causes. The Corps is committed to undertaking a comprehensive review of the effectiveness of its levee inspection programs and communicating the results to Congress and the public.

Emergency supplemental funds appropriated under Public Law 109-148 (enacted on December 30, 2005) included $30 million for the Corps of Engineers to initiate a National Inventory of Flood and Storm Damage Reduction projects, including an assessment of the condition of levee projects. In addition, the President's budget for Fiscal Year 2007 includes $20 million to continue this effort. The Corps is working in conjunction with FEMA to coordinate its efforts with the FEMA Map Modernization program. It is envisioned that data from the inventory will be able to provide technical information to perform or be used as a basis for periodic re-certification of levees as required by FEMA for floodplain mapping purposes.

Current Status

The inventory will be a geospatial database that will allow data to be incorporated into the flood maps prepared by FEMA or, if more detailed mapping is available, could be used with that mapping. The database will allow users to have real time information

readily available. The database development will be a phased process. Each phase will be beta tested by the Corps prior to actual implementation on all Corps Districts other Federal and state agencies. The initial survey will generate administrative data and some technical data of projects in the Corps inventory. This phase is scheduled to begin this month and be completed by the end of June 2006. This is only the first step in populating a geospatial database. Completion of this initial survey will allow the Corps to evaluate the magnitude of the effort to generate the database as well as to have a better comprehensive understanding of the effort involved in performing the technical assessments.

This initial survey will also allow the Corps to begin to identify high risk levee reaches that will be used to start testing the assessment methodologies and procedures. A more detailed data input for technical fields will be beta tested on five to ten Corps Districts near the end of fiscal year 2006. Any lessons learned will be incorporated as the inventory is developed. As the Corps completes a phase, other federal agencies and states will be asked to input data into the inventory. The Corps is and will continue to coordinate with FEMA, the Association of State Flood Plain Managers, and the National Association of Flood and Stormwater Management Agencies on the inventory.

The criteria for the assessments are currently under development. A team is being assembled to develop the procedures and methods for conducting the technical assessments in a uniform and consistent method. The assessments will be able to rank projects using risk to human life and benefits of protecting population centers. For future risk assessments, we also will consult with DHS through the partnership established in the National Infrastructure Protection Plan (NIPP) to integrate consequence and vulnerability information for critical infrastructure into future assessments. The National Inventory will be able to provide an overall condition of levees within the National inventory. It is anticipated that the inventory and assessments will be able to indicate areas of higher risk.

We are committed to putting a program in place that will enable us to better evaluate the risk to public safety in areas located behind the levees, help decision makers set priorities for future levee investments, and ensure that all Americans can make more informed decisions on building homes, locating businesses, and purchasing flood insurance based on the actual risk of flood and storm damages where they live.

This concludes my statement. Again, I appreciate the opportunity to testify today. I would be pleased to answer any questions you may have.

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H.R. 4650, the National Levee Safety Program Act

Testimony of the
ASSOCIATION OF STATE DAM SAFETY OFFICIALS
Before the
Subcommittee on Water Resources and Environment
Committee on Transportation and Infrastructure
April 6, 2006

Mr. Chairman and Members of the Subcommittee:

The Association of State Dam Safety Officials (ASDSO) is pleased to offer this testimony regarding HR 4650, the National Levee Safety Program Act. ASDSO is a national non-profit organization of more than 2,200 state, federal and local dam safety professionals and private sector individuals dedicated to improving dam safety through research, education and communications. Our goal simply is to save lives, prevent damage to property and to maintain the benefits of dams by preventing dam failures.

Dam failures in the United States continue to call attention to the catastrophic consequences of infrastructure failures. The failure of the federally-owned Teton Dam in 1976 caused 14 deaths and over $1 billion in damages, and is a constant reminder of the potential consequences associated with dams and the obligations to assure that dams are properly constructed, operated and maintained. The recent dam failures in Hawaii and Missouri, and the near failure in Massachusetts last year have brought into tragic focus for the public the impact that aging and under-funded dams can have on a community and a state.

We, as dam safety professionals, recognize the similarities between dams and levees and are concerned for the need to keep levees inspected and maintained to protect the safety, health and welfare of the public. We applaud the subcommittee's recognition of the need to assist the states in setting up and maintaining effective levee safety programs.

Attached to this testimony is a survey of state dam safety agencies regarding their administrative authority and knowledge of levee safety programs within the states. Although some states have the authority to regulate levees, most have told ASDSO that they do not have the resources or the departmental direction to regulate levees. It is therefore clear that there is currently very little regulation of levee safety going on at the state level. It is also clear that there has been little or no effort in the past to inventory

levees, which would compile data on their location, physical characteristics, ownership, potential hazard, and condition. States need this type of inventory information to quantify the public safety risks and to effectively implement a levee safety program.

Creating a National Levee Safety Program, using the existing National Dam Safety Program as a model is needed. We therefore support HR 4650, which would create a National Levee Safety Program, as a necessary first step in making levees safer in the United States.

We further recognize that levee inspections alone won't make levees safe. We hope the Congress will consider a levee rehabilitation funding program once an inventory and assessment of levees across the nation is available.

The Association of State Dam Safety Officials recognizes that levee safety programs will rely heavily on the same engineering and regulatory expertise that goes into our state and federal dam safety programs. We therefore urge federal and state policymakers, as they create policies for levee safety, to understand that current staffing and resources at the state levels must be increased if levees are to be added to the states' regulatory jurisdictions. Adequate state programs for levee safety cannot exist, at this point, without federal assistance to the states, through a national levee safety program, coupled with state funding to increase staffing and resources for state dam and levee inspection programs.

ASDSO Policy Recommendations for H.R. 4650

We have several specific comments on HR 4650 to recommend to the Subcommittee.

Definitions—The bill should be amended to require the Corps to develop a standard risk based set of definitions to categorize all levees, similar to the high, significant, and low hazard classification system used for dams. Additionally, standard definitions should be created to prioritize the significance of deficiencies found.

Levee Inventory—The bill authorizes the Corps to maintain an inventory of levees at its discretion. The bill should be amended to require this activity and specify that the inventory should be routinely updated. Updating the inventory based on inspection information maintains a current understanding of which levees may need to be upgraded based on new information pertaining to populations and property at risk should the levee fail. Further, the inventory should include all levees regardless of ownership as many states have no levee safety programs or existing inventory of levees. The National Inventory of Dams, a data base of all dams in the United States maintained by the Corps, includes state and local government dams and privately owned dams as well. The term "periodically publish" should be removed from the bill.

Levee Inspections—The bill would require the Corps to carry out a one-time inspection of every federally funded levee. The bill should be amended to require routine,

periodic levee inspections, as well as the identification and inspection of larger, interdependent flood- and storm-protection systems within which the federal levees function, and provisions for more detailed reviews of levees with significant deficiencies and high levels of population and property at risk behind the levees.

Take out the section entitled, "Determination." This language is too specific for the law and should be discussed in policies and regulations.

Section 3(b)(1)(c) – A clarification of what the "list" is should be included in the bill. What is to be transmitted on the list?

Section 3(e)(2)(b)(i) – A clarification of what the citation is referring to as "Subparagraph A" within the text.

Appropriations— The bill authorizes Congress to appropriate $60 million ($10 million a year for the fiscal years 2007, 2008, 2009, 2010, 2011, and 2012) to carry out the Act, to be available until expended.

ASDSO believes this bill should be should be amended to authorize annual appropriations for specific programs in the bill as follows:

$6 million annually for Corps programs, $3.5 million annually for assistance to the states to implement levee safety programs, $500,000 annually for research and training.

Summary of H.R. 4650, the National Levee Safety Program Act

ASDSO is encouraged that the intent of the bill includes the following provisions:

The bill would require the U.S. Army Corps of Engineers to inspect levees in the United States for the purpose of protecting human life and property. It would require the Corps to inspect all levees built or maintained by the Corps of Engineers, and it would require federal inspections for any non-federal levee at the request of a state's governor.

It would require inspections to determine whether a levee failure would constitute a danger to human life or property.

It would authorize the Corps of Engineers to maintain an inventory of all levees in the United States, along with the results of levee inspections.

Modeled after the National Dam Safety Program, other provisions of the bill would include the following:

- Establishment of a nine-member National Levee Safety Review Board.
- Establishment of an Interagency Committee on Levee Safety, which would "support the establishment and maintenance of effective federal programs, policies, and guidelines to enhance levee safety for the protection of human life

and property through coordination and information exchange among federal agencies concerning the implementation of federal guidelines relating to levee safety."

- Establishment of a national levee safety program. The program would be required have seven specific tasks, including the encouragement of the use of "acceptable engineering policies and procedures for levee site investigation, design, construction, operation, and maintenance, and emergency preparedness"; the development of technologically and economically feasible programs for hazard reduction; the creation of effective state levee safety programs; and the promotion of methods to provide technical assistance to the safety of nonfederal levees.
- A requirement that federal guidelines be established for levee safety utilizing "activities and practices" in use by the states, local governments, and the private sector in the development of the guidelines.
- Establishment of a grant program to assist states in creating and implementing levee safety programs.
- Establishment of research and continuing education programs to improve levee engineering.

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1. Does your agency have regulatory authority or responsibility over levees?

	Response Percent	Response Total
Yes	47.9%	23
No	52.1%	25
Total Respondents		48
(skipped this question)		0

2. If you do not, which agency in your state (if any) does?

Total Respondents	26
(skipped this question)	22

State Dam Safety Law jurisdiction over levees is a very gray area. When does a levee become a dam? Historically, NC Dam Safety has not issued permits or inspected levees. Most of the levees are probably constructed by Federal government, and hence exempt from State dam safety regulation.
None that I know of. Perhaps the Corps has some authority on some of the levees.
None.
Unknown.
No Agency. The Department through our flood plain laws only regulates the construction of new levees. There is no regulatory authority for inspection and maintenance after the levee has been constructed.
Levees in the state are under the control of two Levee Boards. Oversight of Levee Board operation and maintenance of the levees is provide by the U.S. Army Corps of Engineers.
Unknown. Possibly the Corps of Engineers.
Although not the responsibility of the Division of Safety of Dams, the authority lies within our Department of Water Resources, within the Division of Flood Management
local NRD's are involved with a lot of levees but I don't think they has responsibility for all levees
To the best of my knowledge, the U.S. Army Corps of Engineers
None that I am aware of.
None
None, however if state funds are used the loan agency i.e. Colorado Water Conservation Board, some oversight for the project
There is no Alabama state agency that regulates levees. There are some levees & dikes that are federally regulated by FERC, TVA and the COE.
circuit courts through W. Va. Code 19-21 et seq
None.
Probably Maine DEP
Perhaps regulated as a sub-aquaous structure, but not certain.
Yes, for any levee that meets the Statutory definition of a Dam
Yes to #3. Our law refers to any structure capable of impounding water. Public Service Board would have jurisdiction over levees (if any) at a hydro project. Agricultural levees (if any) regulated by Conservation Districts.
None exists
None. Most of the levees in the state are built by US Army Corps of Engineers. They are exempt from the state's permitting requirements. Levees built by other entities do obtain 'floodplain construction' permits from KY Div. of Water. But are not regulated for maintenance and upkeep by the state
n/a
a) U.S. Army Corps of Engineers (COE) b) 21 Levee Districts
none over existing levees. New levees if located in a designated floodplain or floodway would require a local government, city or county floodplain permit.
not sure, if any, possibly local jurisdictions

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3. Describe what types of programs your state has for managing levee safety.	
Total Respondents	47
(skipped this question)	1

None - the authority is in our statutes, but the state currently does not have any program for inspecting or improving levees. The only activity involving levees is our Floodplain Management Section which is in the process inventorying levees as they review FEMA flood maps.
There is no state program. After the levee protecting the Town of Princeville, NC failed during Hurricane Floyd, the question of who should inspect levees arose. I don't think that question has been answered yet. I have heard that local authorities may consult the local NRCS or Corps of Engineers. The current Dam Safety program does not have a list of all the levees nor the resources to add them to the inspection responsibilities.
N/A
Levees meeting the size criteria (> 6 feet in height and pond area > 5 acres) are covered under our dam safety act.
None.
Authority over construction and modification only. There is no administrative jurisdiction over levee safety.
Law requires prior approval of Chief Engineer for a person, corporation, drainage or levee district, county, city or township to construct or maintain a levee. Engineering plans must be submitted. Levees are assigned hazard classes similar to those used for dams. Hazard class affects minimum design criteria. Projects are approved if they are feasible and not contrary to the public interest. This regulatory approval system is the major program dedicated to managing levees. There are local districts created under state law to operate and maintain levees. During major flooding events this office monitors the performance of affected levees.
The Ohio Department of Natural Resources has issued permits for the construction of new levees for over 25 years (about 15 permits). We have also responded to a few emergency situations involving levees. The department has authority for periodic inspection of levees, but we have not had the resources to do that. In the last few years, we have taken steps to inventory high hazard levees with an eye toward inspection and more active safety regulation.
None. We have offered flood control grant money to some of the local governments that own the levees for safety (maintenance) upgrades.
There currently is no levee safety program. Entities in the NFIP have the authority to review plans and specifications for approval of levee construction.
The Levee Boards regulate activities in the vicinity of the levees such as drilling water wells and boreholes, seismic exploration, excavation, etc. and has a far reaching jurisdiction to regulate any activity that could adversely impact the levee. The Corps also has broad jurisdiction to regulate activities that might damage a federal flood control project
Unknown, if any.
Assist with Levee maintenance by working with local reclamation districts. A joint operations center is operated by the Department of Water Resources providing river conditions and forecasts, weather forecasts. Assists with flood emergencies and inspections. Partners in operation of reservoir releases. Conducts floodplain, snow survey and water movement data and studies. Provides flood fighting training
None
Pennsylvania's Department of Environmental Protection has been constructing flood protection projects since the 1940's with many of the projects being compacted earth levees. All of our projects are constructed with 100% state money. Our projects require a local government sponsor who is then responsible to operate and maintain the project. This partnership is continued in perpetuity where annual inspections are made with the project sponsor and any needed maintenance is identified. Our state projects are eligible for repairs under the U.S. Army Corps of Engineer's Public Law 84-99, which means federal money will be spent to make repairs following damage from major floods.
Unknown
None.
Currently, there are no resources directed toward a levee program.

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None
We require a construction permit if constructing a levee that would divert greater than 50 ac-ft of water from the area being protected.
There used to be annual joint state/Corps of Engineers inspections of the levees in Jackson Hole along the Snake River but these were stopped by order of someone in the Corps.
We have nothing specific in our Safety of Dams Rules, but we have several sections in our SD Codified Laws (46-5-47 & 46-5-48) which deal with issuing Flood Control permits. SDCL 46-5-47 states that 'No person may construct facilities on any watercourse to control floods for the pursuant of preventing or alleviating damage without a permit issued pursuant to the procedure contained in chapter 46-2A.'
The Idaho Department of Water Resources Dam Safety Program regulates levees that classify as dams (are more than 10 feet in height or store more than 50 ac-ft of water). However, levees, meaning a retaining structure alongside a natural lake which has a length that is 200 times or greater that its greatest height measured from the lowest elevation of the toe to the maximum crest elevation of the retaining structure, are exempt from dam safety regulation. As far as levees along rivers and streams, I know of no other Idaho state agency that regulates the safety of these structures. The Department's Stream Channel Protection Program requires a permit to do any work below the mean high water mark of rivers or streams in the state, which includes repair and maintenance of levees.
None, Although some flood protection evaluation in the flood plain mapping program local jurisdiction is responsible for levee safety and adequacy
Our primary authority is to approve plans for levees that will remove property from the regulated floodplain. We require these structures to be designed to Corps of Engineers standards. We only have inspection authority over two of the 70 inventoried levees in the state. We would provide technical expertise in the case of a levee failure though we do not have a specific statutory requirement to do so.
None
A flood plain construction permit is required for most levees built in Iowa. Project review is primarily concern with backwater effects of the levee system. A cursory look is made to ascertain that the structure was designed using standard engineering practices and that adequate interior drainage is provided. Iowa does not have a levee inspection program.
Puerto Rico Dam Safety Program
By law, levees are regulated. There are presently no regulated levees in our inventory.
maintenance only through drainage, levee and reclamation districts
I understand that there are some levee districts within Arkansas that manages some levees.
Dam Safety Program
Unknown
Levees are considered to be dams, and therefore subject the the States's dam safety jurisdiction.
As need basis only.
None
In New Hampshire, levees are regulated the same as dams under the state's dam safety program, since they conform to the state's definition of a dam; i.e., an artificial barrier, including appurtenant works, which diverts water, and which has a height of 4 feet or more.....
Rules are identical for dams and levees
We do not have specific regulatory control over levees. The law does not address them, however, since they do retain and/or divert water we could use the existing Dam Safety law to get involved if needed. Also, through our Stream Alteration law, we can control the placement of levees. We do not have any law dictating on-going safety and/or maintenance inspections etc. as we do with dams. Based on the statutes we have, our involvement would be limited to the initial construction, or through the development of a safety hazard.
Regular inspections are performed according to the Hazard Classification; High or Moderate every 2 years; Low - Every 5 years
Regulated as dams.
No programs
See item #4
Would be treated like a regulated dam.
a) Annual Inspection by the COE and the local levee district staff b) Review of permit applications for construction, drilling, etc. within 1500' of the levee c) No construction activities within 500' of toe of slope of River levees

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Any new levee must be owned and maintained by a local government. http://data.opi.state.mt.us/bills/mca_toc/76_5_11.htm ie Montana Code: Title 76, Chapter 5, Part 11 Water Conservation and Flood Control Projects.
none

4. From your general knowledge, are there levees in your state that cause concern from a safety standpoint?

Yes. See 1993 and 1995 flood events in Missouri.
There are levees in Kansas that do not meet the state's minimum criteria and there are levees that have been of serious concern or failed during flooding events. However, I do not know of any levees protecting urban areas which are of immediate concern from a safety point of view.
Yes. We are periodically notified of levees that are built in violation of the permit laws. Also, we know that there are several high hazard levees that no one has inspected for many years.
Yes, this is a major concern of California.
Yes, there are many levees that do not meet safety standards. This may be due to poor material used during construction, poor compaction, not adequately sized, or not maintained. The levees constructed as flood protection projects generally meet safety standards, although some of the older projects may need to be rehabilitated to meet the hydrologic and hydraulic changes that have taken place within the watershed.
Yes The U.S. Army Corps of Engineers does inspect the larger federal flood control levees in Indiana. There are, however, other non-federal levees that provide protection to residents, business or infrastructure that are not currently inspected.
They don't cause as much concern as 10 years ago. Our larger levees are along the Red River, which flooded in 1997. Since that flood, many of the levees have been reinforced and reconstructed.
We have had some levee failures or near failure in the past that have caused emergency response and damage.
One levee in Richland County, south of Columbia, has failed in the past and caused problems for the City of Columbia's Wastewater Treatment Plant and for Heathwood Hall, a private school.
Yes, there are levees in MD along Anacostia River, Oxen Run, and Potomac River. Some are built by the COE. Most of these levees are flood control structures and there are safety concerns.
Uncertain, as there is no state inventory
No. We have only one levee in New Hampshire. It is a local flood protection project in Nashua, constructed by the Corps of Engineers, and it is in good condition.
Levees are not considered to be a major cause of concern from a safety stand point in Utah. Some property damage could occur from a levee failure but it is unlikely that there would be loss of life.
Yes, numerous cities and townships along large rivers (Ohio, Cumberland, Kentucky, Green) have floodwalls that were built to protect the communities from high water conditions.
Yes a) Earthen levees that have subsided below design finished grade b) Floodwalls on top of existing earthen embankments with questionable underlying soil strength c) Levees that are presently lower than authorized elevation
not enough information on locations and condition

5. You have reached the end of the survey. If you would like to comment further, please use this space. Thank you for your input!

Total Respondents	**19**
(skipped this question)	**29**

To design, construct and maintain levees to the same standards as dams will require funding and effort well beyond what has been allocated for this in the past. Levees may be a good case for risk assessment. Certainly, levees in New Orleans deserve more attention than a levee only protected uninhabited farmland.
The Moose Creek Diversion Dam (NID#AK00085) is the largest levee system in Alaska and is regulated by the USCOE. Several other small levees may exist in coastal or riverine communities. These are either unregulated, or possibly maintained by the USCOE or local governments. Safety concerns are unknown by ADNR.

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Although we have a state-wide permitting system, there are a large number of un-permitted levees and most levees, permitted or not, protect agricultural land. There seems to be interest nation-wide in an inventory of levees. If such an inventory is to be conducted it will be practical only if screening criteria is used that avoids the clutter of these low impact levees.
I'm not sure if RI has any levees. The City of Providence has a hurricane barrier which is closed to keep high water from flooding the City. Under normal conditions it does not impound water. I believe this barrier has ACOE oversight.
One question to ask states if they answered yes to question number 3 is do they maintain an inventory and if so what information do they have.
Levees in the state of Mississippi are well maintained and frequently inspected. After every high water event, a major repair effort is undertaken by the Corps and the Levee Boards to repair all slides and other flood damage.
Pennsylvania supports any effort to adopt some type of levee inventory and safety standard. We have information on all our projects dating back to the 1940's.
There is only one levee listed in the NID database for Alabama. It is the Henry Martin - Levee with an NID ID AL02312. The Corp of Engineers levee in Elba is not listed. This is another reason for the need of a Dam Safety Inventory and Classification Program for Alabama. This database should perhaps include levees. There are levees & dikes, which are federally regulated, but are not in the NID.
Levees are not presently a big issue in SC. The levee failure that caused problems in lower Richland County resulted under conditions similar to a five or ten year flood on the Congaree River.
Maryland Dam Safety wants to inspect the levees in MD and make sure they are safe, but it faces constraints regarding lack of resources and funds.
Question #3.....Any hydraulic structure exceeding 10 feet height.
Delaware is in the very early stages of their Dam Safety program. The inclusion of issues relative to levee regulation at this time will not be possible.
Florida Statute 373 covers all water control structures
Most of the levees in KY are located along the Ohio and Mississippi Rivers in the western part of the state and are constructed to protect crops and farm land. We do not have any levees that specifically serve as flood protection for residential or commercial dwellings. Most of the levees are small (3-10 feet). We do not have any regulatory authority over Floodwalls that were constructed by and are maintained by the Corps. There are only a handful.
A 'levee inspection manual' published with some oversight by the state will be welcomed.
Anything that meets the definition of a 'Impounding Structure' (Regulated Dam) is regulated as a dam unless it meets one of the categories of exclusions. This would hold true for levees, unless they met one of the exclusions such as already being under regulation by the Federal Government. Levees in Virginia are only regulated if they meet the VA Dam Safety Regulatory definition and do not meet any of the exclusions.
a) Since failure of levees in New Orleans area: the design, construction, inspection and operation of some levees have come under scrutiny by local, state and federal government and a number of universities. b) Lack of consistent stream of federal funds to complete the authorized flood and hurricane protection projects have resulted in incomplete levee protection system in South Louisiana.