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FLOOD PREPAREDNESS AND MITIGATION: MAP MODERNIZATION, LEVEE INSPECTION, AND LEVEE REPAIRS

JOINT HEARING

BEFORE THE

AD HOC SUBCOMMITTEE ON DISASTER RECOVERY AND AD HOC SUBCOMMITTEE ON STATE, LOCAL, AND PRIVATE SECTOR PREPAREDNESS AND INTEGRATION

OF THE

COMMITTEE ON HOMELAND SECURITY AND GOVERNMENTAL AFFAIRS UNITED STATES SENATE

ONE HUNDRED ELEVENTH CONGRESS

SECOND SESSION

JULY 28, 2010

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WEDNESDAY, JULY 28, 2010

U.S. SENATE,
AD HOC SUBCOMMITTEE ON DISASTER RECOVERY,
JOINT WITH THE SUBCOMMITTEE ON STATE, LOCAL,
AND PRIVATE SECTOR PREPAREDNESS AND INTEGRATION,
OF THE COMMITTEE ON HOMELAND SECURITY
AND GOVERNMENTAL AFFAIRS,
Washington, DC.

The Subcommittees met, pursuant to notice, at 3:02 p.m., in room 342, Dirksen Senate Office Building, Hon. Mary L. Landrieu, Chairman of the Subcommittee on Disaster Recovery, and Hon. Mark L. Pryor, Chairman of the Subcommittee on State, Local, and Private Sector Preparedness and Integration, presiding.

Present: Senators Landrieu, Pryor, Tester, Burris, and Collins (ex officio).

OPENING STATEMENT OF SENATOR LANDRIEU

Senator LANDRIEU. Good afternoon. Let me call this meeting of the two Subcommittees to order, and we will be joined in just a minute by Chairman Mark Pryor, who chairs our sister Subcommittee and other Members will be joining us as the afternoon unfolds.

I want to begin by saying how pleased I am to host this joint meeting. It is a little unusual, but, I think, very important and very necessary because of the information that our Subcommittees are going to cover. Senator Pryor, welcome. And I will be giving a brief opening statement, turning it over to my co-colleague, Chairman Pryor, and we are thankful to be joined by Senator Tester from Montana.

Before I begin my opening statement, I would just like to refer the audience and those listening to this map,[1] which shows the United States counties where levees are found, because that is what our hearing pertains to levee certification, flood maps and flood insurance availability and affordability. These are very important issues for our country, and I thank you, Senator Collins, for joining us. This map shows that this really is an issue of national significance, and I am glad to be joined by the Senator from Maine because she has quite a few counties in Maine that have levees.

[1] The map referenced by Senator Landrieu appears in the appendix on page 44.

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You can see that the State of California, which I am learning has an extraordinarily intricate set of levees. Almost the entire State is represented. Of course, you can see through the Mississippi Delta, which is what I represent, a great stream of levees all the way up the Mississippi. And in Montana and in virtually every part of this country, there are levees.

The second map[1] will show—the map in the light green and pink—the areas where flood maps have already been updated, but the pink are areas that are still under development.

I am going to try to be brief because we have two panels, but I want to call attention to a March 18 letter that 16 Senators of both parties signed to Administrator Fugate and Secretary Darcy, who is with us today. I won't read the entirety of the letter, but it says, in part, we represent a diverse group of constituents with a variety of problems that have arisen as the Flood Insurance Rate Maps (FIRMS) have been updated. Our constituents have expressed several concerns about flood mapping, including a lack of communication and outreach with local stakeholders, a lack of coordination between Federal Emergency Management Agency (FEMA) and the Corps of Engineers in answering questions about flood mapping, flood insurance, and flood control and infrastructure repairs, a lack of recognition of locally funded flood control projects when determining flood zones, the affordability of flood insurance, inadequate time and resources to complete flood repairs, control structures before maps are finalized, etc, etc.

I just wanted to begin by saying this, that this is really a concern of so many members of the Senate representing a variety of different sections of the country. This is not just a Southern issue. It is not just a Gulf Coast issue. It is not an issue necessarily related directly to Hurricane Katrina, although 5 years ago in August, that was probably one of the most vivid and horrifying examples of what happens when one of our levee systems fail. But we had the Midwest floods in 2008, where Cedar Rapids, Iowa, was in large measure, parts of it destroyed. We had the floods in Georgia and North Dakota in 2009, and then most recently in Rhode Island and Tennessee in 2010.

So this hearing is really an attempt to get a status report on where we are, responding to some of these issues and questions. I will submit the rest of my opening statement that I prepared for the record. But I hope that we are getting some answers to questions like, are FEMA's flood maps technically accurate, and if not, how can they be improved? How can the FEMA process for resolving map disputes with local communities work better? Should the Corps of Engineers offer to inspect locally-owned levees, and how else can local governments finance these costly engineering inspections? How can people afford flood insurance, and more?

So I am going to submit the rest of my statement for the record, but this has been a particular focus of mine for several years and I hope we can get to the bottom of some of these issues.

Senator LANDRIEU. Senator Pryor.

[1] The map referenced by Senator Landrieu appears in the appendix on page 45.

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OPENING STATEMENT OF SENATOR PRYOR

Senator PRYOR. Thank you, Madam Chairman, and thank you for working on this issue as diligently as you have been. We just really appreciate your leadership on this and many other things.

I want to thank all the Members of the Subcommittee who are here today and who will be coming and going today. I know that we have really two very strong panels, and I hope this doesn't take too long, but there is a lot of ground to cover here, so I appreciate all the witnesses coming today.

And also, I want to recognize two people who are not on the Subcommittee. The first would be my colleague from Arkansas, Senator Lincoln, because she has shown great leadership, not just in Arkansas, but nationally on this issue. Second is Senator Cochran, and he and I have worked on this issue together and we have some legislation and he has been a great partner in that, so I really want to thank both of them, even though they are not here.

And then I would just like to say a few words that you all know and my colleagues know that I have been working on this issue for years now, and recently we were able to get a letter to, I think, FEMA and the Corps that had Senators from 13 different States, and this has gone from the little problem in Arkansas, where it kind of—we were one of the early States to have to go through this, and it is really mushrooming into a national concern.

And there are really two basic concerns, I think, that sort of Senators here, or hits States in different ways, but two basic concerns. I think Senator Landrieu really fits in this category, first is the issue of levee certification and the responsibility for the repairs, etc. We can play the blame game all we want on this, but the bottom line is, right now, there are lots and lots of locally owned levees that need a lot of work, that need some repairs, need to be modernized, and they just don't have the local resources to do it. As hard as that may be, we need to think through that and see if we can come up with a solution here.

The second is really a little different, and that is once a levee is certified, what does that mean? When the maps are done, I am going to have some questions about something on the maps. They call it Shaded Zone X, but what does that mean to a community? A lot of communities have passed an ordinance that has been drafted by FEMA. What does that mean? If they don't agree with the map, can they appeal? How do they appeal? What is the redress there? So it falls under that.

We also have something in our State that is not unique to Arkansas, but it is probably unique pretty much to the Mississippi River States, and that is we have the Mississippi River system of levees and I think the taxpayers, State, local, Federal taxpayers, have invested something like $32 billion, or maybe more, in that levee system. It has worked great. A lot of these levees will keep out floodwaters to the 500-year mark, and that is spectacular. But my sense is that when these maps are drawn, there is really not a lot of credit given to the fact that you have this extraordinarily good, strong levee system and a lot of my State, at least, has ended up in what they call Shaded Zone X, which is in the 500-year floodplain.

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I know that some of my colleagues are frustrated about this and I know that people in Arkansas are frustrated. If my constituents are frustrated, that means I am frustrated. We haven't had a lot of real progress that has been made on this, as hard as we have tried. FEMA has not been the easiest to deal with on this, quite frankly. But we are going to continue to work on this and I just want to thank my colleagues for being here today and thank you for your attention.

Senator LANDRIEU. Thank you.

Do the Members have opening statements? Senator Tester.

OPENING STATEMENT OF SENATOR TESTER

Senator TESTER. Just very quickly. First of all, it is in order to thank both Chairmen of this Subcommittee, and I think that if the folks who are testifying took notes of what Senator Landrieu said about the questions, those are the real questions. And I can tell you that this is not a little issue. This is a big issue and we need to get it fixed, and I very much appreciate you bringing this Subcommittee together.

One last thing. On the second panel, a good friend of mine, a Representative from the State of Montana's Legislature is here, Bob Mehlhoff, and I certainly appreciate Bob making the trip out and being willing to testify on this very important issue from a local perspective. Thanks.

Senator LANDRIEU. Thank you, Senator Tester. Senator Collins.

OPENING STATEMENT OF SENATOR COLLINS

Senator COLLINS. Thank you, Senator Landrieu. I thank you and Senator Pryor for your leadership in this very important issue.

I support FEMA's efforts to modernize the outdated flood maps with new modeling and more detailed data, but it is absolutely imperative that FEMA work with the affected communities in doing so.

In my State, initially, FEMA revised the flood map for Maine's largest city, Portland, without consulting with Portland city officials, and the result, and I know Senator Landrieu can appreciate this because it was from her that I learned about V Zones, but the result would have had the effect of classifying much of the waterfront as a high-risk flood zone and that would have had an extraordinarily detrimental impact on the economic vitality of Maine's largest city. The city questioned the accuracy of the map, hired a consultant to do additional modeling, and FEMA was very helpful in accepting that new data, taking a look at its own modeling, and ultimately a good decision was reached and I am grateful for FEMA's help in that regard.

But Portland's complaints and experience are not unique. Now FEMA is revising the flood maps all along a part of Maine's coast. Every community is very worried about where it is going to get the money to pay for consultants to provide the kind of detailed modeling that will lead to an accurate assessment.

So those are issues that I want to explore with our witnesses today, and again, I thank you for holding this important hearing.

Senator LANDRIEU. Thank you.

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Well, let us get right into our first panel. We are grateful to have Jo-Ellen Darcy, who is our first witness, who serves currently as the Assistant Secretary of the Army for Civil Works, and in this role she oversees programs for conservation and development of the Nation's water and wetlands resources, flood control, and navigation. So this is squarely in her jurisdiction. We are looking forward to your testimony today.

Our second witness is Dr. Sandra Knight, who serves as Deputy Federal Insurance and Mitigation Administrator for FEMA. In this role, Dr. Knight oversees floodplain mapping, floodplain management, flood insurance, and hazard mitigation. I understand, Dr. Knight, that you have asked for some additional time in your opening statement and I will allow that because I think your testimony is extremely important, and we are very anxious to hear any changes or updates that you could present to us today.

But let us start with the Hon. Jo-Ellen Darcy.

TESTIMONY OF HON. JO–ELLEN DARCY,[1] ASSISTANT SECRETARY OF THE ARMY, CIVIL WORKS, U.S. ARMY CORPS OF ENGINEERS

Ms. DARCY. Thank you, Senator Landrieu, Senator Pryor, Senator Collins, and Senator Tester. Thank you for the opportunity to testify before you today. With your permission, I would like to make a short statement and submit my entire written statement for the record.

The U.S. Army Corps of Engineers (USACE) shares with the Federal Emergency Management Agency the expertise and the mandate to address the Nation's vulnerabilities to flooding. However, the responsibility for managing the Nation's flood risk does not exclusively reside with Federal agencies, such as the Corps and FEMA. Rather, it is shared across multiple Federal, State, and local government agencies with a complex set of programs and authorities, including private citizens and private enterprises, as well as developers.

The Corps and FEMA have programs to assist States and communities to promote sound flood risk management. However, flood risk can further be reduced locally through tools like evacuation plans, land use planning, and public outreach. Public safety is our top priority and our top responsibility.

FEMA has embarked on a Map Modernization Program to update and improve the Nation's Flood Insurance Rate Maps. Throughout this program, the Corps and FEMA have been successful in leveraging data, partnering on floodplain studies, and collaborating on related policies in order to provide the most current flood hazard information to the public. Both agencies will continue to build upon this strong partnership.

In 2007, the Corps created the Levee Safety Program to assess the risk associated with levees and recommend courses of action to reduce the risk to the public, to property, and to the environment. There are approximately 14,000 miles, or 2,000 levees, within the Corps' authorities. A majority of these levees are Federally authorized but locally operated and maintained. The main activities with-

[1] The prepared statement of Ms. Darcy appears in the appendix on page 47.

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in the Corps' Levee Safety Program include creating and maintaining the National Levee Database (NLD), levee inspections, and developing new procedures for assessing levees, such as establishing tolerable risk guidelines.

The Corps conducts regular levee inspections to verify proper operation and maintenance, identify deficiencies that need repair, and document performance over time. Following each inspection, the Corps communicates the findings to the levee sponsor in addition to recommending items for repair and possible interim risk reduction measures, if they are necessary. A copy of the inspection results is also provided to FEMA. The Corps will assist the local sponsor and other stakeholders to develop the best path forward. That may include a more comprehensive flood risk management approach as opposed to keeping focus on just the levee as the only means to reduce flood risk.

Levee System Evaluations, otherwise, known as Levee Certification, for the National Flood Insurance Program (NFIP) is for flood insurance purposes and the 1 percent flood event. It is not a safety standard for levees. Because local entities are responsible to administer the requirements of the National Flood Insurance Program and are often responsible for operating and maintaining the levee, the Corps considers the levee certification a local responsibility. However, the Corps will work with FEMA and the local entity to provide information collected through our Levee Safety Program.

Looking at the bigger picture, the 14,000 miles of levees within the Corps' Levee Safety Program only represent about 10 percent of the levees nationally. The condition of many of the levees throughout our Nation is unknown.

I would like to mention the work accomplished under the National Levee Safety Act of the Water Resources Development Act (WRDA) of 2007, which established the National committee on Levee Safety and directed it to develop recommendations for a National Levee Safety Program (NLSP). The committee completed its draft report in January 2009 and put forward 20 recommendations for creating a National Levee Safety Program.

In May 2009, the Army provided the final draft report to Congress. Although the Corps chairs the committee, the recommendations do not and were not intended to represent the administration's position. The Corps is working to implement certain components of the Act and coordinate agency levee safety activities with the committee for activities that align with its recommendations.

I would like to thank you for the opportunity to testify today on the Corps' roles and responsibilities in FEMA's remapping program and levee safety. I would be pleased to answer any questions that you may have. Thank you.

Senator LANDRIEU. Thank you. Dr. Knight.

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TESTIMONY OF SANDRA KNIGHT,[1] DEPUTY ASSISTANT ADMINISTRATOR, FEDERAL INSURANCE AND MITIGATION ADMINISTRATION, FEDERAL EMERGENCY MANAGEMENT AGENCY, U.S. DEPARTMENT OF HOMELAND SECURITY

Ms. KNIGHT. Good afternoon, Chairman Landrieu and Chairman Pryor and distinguished Subcommittee Members and Senator Collins. We appreciate the opportunity to testify before you today and discuss flood mapping and FEMA's role in helping communities identify and address their flood risks.

It is my privilege to share the panel with Ms. Jo-Ellen Darcy. I appreciate that we have the opportunity to demonstrate our partnership as we manage the flood risk in our Nation.

Before I begin today, I would like to first thank the Subcommittee for providing me with additional time to make my opening statement. Flood mapping can be complex and at times confusing, so it is understandable that many of your constituents have questions or concerns about the program and how it affects them. That is why I am pleased to have the opportunity today to break down this complex issue so that we can focus on the underlying goal of the National Flood Insurance Program, which is to protect property and save lives.

To help structure my remarks today, I would like to address the most common questions that we hear on flood mapping and the National Flood Insurance Program.

Why is flood mapping important? Each year, communities in every region of this country experience severe weather events that lead to flooding that can cause damage to property, hurt the economy, and tragically result in the loss of life. Flood mapping is important because it helps communities identify the risk posed by flooding before it occurs so that those losses can be minimized or prevented.

New and updated maps not only reflect better data on hydrology and topography, but also show changes due to variations in weather patterns, changes in landscape, the impact of development on drainage patterns, and the extent of community vulnerability to floods. It is the responsibility of FEMA to identify and map flood risks in communities across the country so that it can establish and maintain a fair and accurate insurance rating mechanism for the NFIP.

So why are we mapping now? As part of the National Flood Insurance Act of 1968, Congress mandated that flood maps be regularly updated to reflect the risk posed by flooding. And more recently, in 2003, Congress began appropriating funds to update and modernize these out-of-date flood maps that too many communities were relying upon to make important decisions regarding development and public safety.

Prior to 2003, flood maps were static paper documents, limited in their detail, and hard to use and maintain. In some cases, the maps were 20 to 30 years old and did not reflect current risks or recent changes in the watershed. Today's maps are digital and provide more detailed, reliable, and useful data that can be updated more frequently and in a cost effective manner. Using modern tech-

[1] The prepared statement of Ms. Knight appears in the appendix on page 56.

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nology, digitized maps can be easily shared among homeowners, community decision makers, and other stakeholders. And, in fact, Flood Insurance Rate Maps are accessed more than 30 million times a year.

As a result of this new mapping effort, we have a better picture of what areas are most likely to be impacted by flooding. In turn, this information will help emergency personnel write response plans that account for new and evolving flood challenges while also giving home and business owners critical information on how flooding could impact their property.

In short, accurate maps reflecting current flood risks lead to better decisions how to protect a community.

So how do we do the flood mapping? Mapping the Nation's flood hazards requires a process that incorporates data collection, analysis, and review to make sure that each map reflects the best information available to communities and to FEMA. While we are confident that the science we use to develop community maps is sound, making and maintaining accurate maps is not simple or done without considerable investment. That is why we work closely with State and local communities and other Federal agencies, such as the Corps, to get the most accurate information and latest science to ensure the best available information is reflected on the maps.

Because of the scientific judgments and assumptions that go into a flood study, there are sometimes differences of opinion about the end result. That is why FEMA has an appeals process for communities. FEMA reviews alternative analysis and determines whether they are superior to those used for the flood study. And further, to improve the process, beginning the first of November, FEMA is making available an independent scientific body, a scientific resolution panel that can be convened at the request of the community or FEMA to resolve conflicting data on the maps.

So why are people in floodplains required to purchase insurance? Well, the short answer is that it is the law. The 1973 Flood Disaster Protection Act (FDPA) directed that mortgage lenders require people in special flood hazard areas who have a Federally-backed mortgage to purchase flood insurance, and while some homeowners may question whether they really need insurance, it is important to keep in mind that during a 30-year mortgage, property owners located in a 100-year flood zone or Special Flood Hazard Area (SFHA) have a more than 26 percent chance of experiencing flood damage.

Even when flood insurance is not required, it is more often than not still needed. A quarter of all flood claims come from moderate and low-risk areas, and flood policies in these areas are affordable. So we encourage all property owners to talk to their insurance agents, discuss their risk and options, and make sure they are protected.

However, we understand the concerns that many have about the additional costs of flood insurance coverage, particularly during these challenging economic times. To help reduce the cost of insurance, the NFIP gives property owners the ability to purchase a preferred risk policy at a discounted rate when they are newly designated in high-risk areas. Further, in response to concerns that we have heard from many of your constituents, we are implementing

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a new policy on January 1 that will extend the time frame for property owners to purchase these lower-cost preferred risk policies.

So why do levees need to be accredited? There are thousands of miles of levees in the United States, as seen here. They are designed and constructed to provide a last line of defense for people and properties against major coastal and river flooding events. Accurately depicting flood hazards near levees on flood maps is critical to ensuring the public is aware of the unique flood risks associated with levees so they are armed with facts that will allow them to reduce their risk. Levees require regular maintenance to maintain their level of protection. The fact is, levees can and do decay over time and maintenance can become a serious challenge. When levees do fail or are overtopped, the resulting flood damage may be more significant than if the levee was not there at all. So home owners and communities must be aware of what protection they get and do not get from a levee.

FEMA's levee-related responsibilities are spelled out in Title 44 of the Code of Federal Regulations (CFR). Based on these regulations, a levee owner must submit documentation to FEMA demonstrating that their levee meets minimum standards in order for it to be recognized on a flood map. Once it is recognized, the community behind the levee will be identified on the map as being protected against a 1 percent annual chance flood. Flood insurance is not required in those areas, but it is recommended.

We also understand that some local levee owners do not have immediate access to the documentation required to certify their levees, even though they may be performing well. While FEMA does not have the funding nor the authority to manage this process on behalf of the levee owners, we do have programs in place, such as the Provisionally Accredited Levee (PAL) designation, to give them additional time to produce and collect the required documents.

So in conclusion, I would just like to say FEMA is working diligently with our Federal, State, and local partners to update flood maps nationwide and address the concerns of communities. We will continue working with all of our stakeholders to analyze and identify flood risks, produce useful and informative flood maps, and communicate the true and current hazards for Americans where they live, work, and play. We have both the legal and moral obligation to depict that risk accurately, and we are committed to meeting those responsibilities.

Again, thank you for this opportunity to participate in today's hearing and I am prepared to answer questions, as well.

Senator LANDRIEU. Thank you, Ms. Knight. We have quite a few.

It is my understanding that under current law, FEMA can provide a community up to $250,000 to help them with mapping. Do you know how many communities you have been able to help with these grants in the last year or two?

Ms. KNIGHT. We are under statute authorized to do that, but we haven't been appropriated to do it.

Senator LANDRIEU. So you haven't been able to help one community?

Ms. KNIGHT. However, I would like——

Senator LANDRIEU. I mean, with that grant program.

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Ms. KNIGHT. I am not sure it is a grant program under the law. But what we do have is a Cooperative Technical Partnering (CTP) program and we can provide funds through the CTP to the State and communities that——

Senator LANDRIEU. How much money have you sent out to local governments specifically, and how many communities do you think you have helped come up with local flood maps? Do you have that information?

Ms. KNIGHT. I don't have the dollars. We do have the CTPs in many of our States and communities and we pass funds to them to help put the data together.

Senator LANDRIEU. Alright. If you could submit that, because it is my understanding that FEMA is authorized to provide up to $250,000 to a community for mapping support activities like hydrology studies, but that you don't have any money to do that.

Ms. KNIGHT. Well, through the CTPs we do—I have been passed a note that we do provide $75 to $80 million a year to the——

Senator LANDRIEU. OK, and the CTPs are——

Ms. KNIGHT. Cooperating Technical Partners.

Senator LANDRIEU. So is that actual money or is it just in-kind assistance through professional services?

Ms. KNIGHT. No, it is actual funds to actually do some of the work. They can do some of the technical things. They can do outreach. There is a list of activities that they can do with that money to help us not only build the maps and the data, but to communicate and do outreach.

Senator LANDRIEU. Do you have any idea of the numbers of communities that you served, how many are still on the waiting list that haven't received funds?

Ms. KNIGHT. No, ma'am. We can get back to you with that——

Senator LANDRIEU. If you could get back to us——

Ms. KNIGHT. I don't know that they have been—they have asked—

Senator LANDRIEU [continuing]. Because that is what we are trying to get. One of the things I am trying to get to is how many communities around the country have asked for technical assistance and been denied, either because we don't have the personnel or the funding to help them. That is one thing that I am trying to understand.

Another is this V Zone issue, which I continue to bring up and you can imagine why, because that is the V Zone in Louisiana. And a 1977 law prohibits Federal funding for new construction in what we call High-Velocity Zones. In this area, I would imagine, not counting the City of New Orleans, which is slightly outside of that V Zone, that maybe a million people live in that zone. The entire City of Houma, I think, is included in the V-Zone. A large part of Cameron Parish is there.

So my situation is that in a V Zone, when a hurricane hits, and they will hit regularly this area, when a building is knocked down, the current law prevents us from building a new building in that zone, even if we build it 18 feet above sea level. So we do not have a good understanding of how to get out of this situation, because we can't move a million people. We have to figure out how to live in a sustainable way. And so I am going to come back to this in

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a minute. I have just one more question and I will turn it over to Senator Pryor.

The other question is, and this comes from, I think, one of our panelists on the second panel, and I want to state this for the record. In Dr. Maidment's written statement, he says "Base Flood Elevations (BFEs) are only shown on floodplain maps that have been prepared with high-quality land surface elevation information and detailed flood modeling studies. Maps that show only floodplain boundaries have the disadvantage of implying that every building in a designated flood zone may flood and that every building outside the flood zone is safe. Providing floodplain residents with elevation of structures relative to the expected height of a number of floods offers a better way to define risk."

What percentage of your maps right now, if you can say this, include high-quality elevation data as opposed to boundary lines? Do you know?

Ms. KNIGHT. Well, I know that what we have for—of course, the map modernization was actually moving the historic maps into digital format. Of that, 30 percent of the stream miles are represented with new science and information.

Senator LANDRIEU. So would you say that you think 30 percent of your maps, whether they are digitized or in the old form, reflect this high-quality elevation data? Do you think that is correct? And you don't have to answer now, but if you could get that information, because I think it is very important for our Subcommittee to understand what we are dealing with, not whether the maps are digitized or not, it is whether they are high quality and elevations because that would help the local communities.

I have others, but I know my colleagues have questions, as well. Let me turn it over to Senator Pryor.

Senator PRYOR. Thank you, Madam Chairman.

Ms. Knight, let me start with you, if I may, and that is I will go ahead and ask you to look at these maps here. These are two maps from Crittenden County, Arkansas, which is the West Memphis and Marion area. This map that is closest to me, which is on your left, is the map that you guys did in 1981. And next to it, it is not exactly the same area, but that little area that has all the streets on it is clearly on the second map. That is Marion, Arkansas, a little part of Marion, Arkansas, and it is on the second map, which is the proposed map that you have now.

There are some differences in what you call Zone X, which is the 100-year floodplain, and there are a few minor differences, which I understand those happen. But the most dramatic difference on that map is that the second map is all gray, and that is the Shaded Zone X. In 1981, you didn't have a Shaded Zone X—

Ms. KNIGHT. I can answer that.

Senator PRYOR [continuing]. And now you do. Can you tell us why you have gone to the Shaded Zone X?

Ms. KNIGHT. Yes, Senator, I can. Zone X is not the Special Flood Hazard Area. It is an area that recognizes—there are several designations for Special Zone X. The one you are discussing here or pointing out here is actually an area protected by a levee. And so in the map of 1991 [sic], there was not a regulation in place that said that we were to certify levees. In 1986, that was changed and

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we were required to do that. As part of that, we included in our policy that Zone X behind levees should be shown to the public so they understand their risk of living behind a levee. It does not require—it does not mandate insurance. It doesn't mandate that they do any special floodplain ordinances. It is not a Special Flood Hazard Area.

Senator PRYOR. OK, but you mention that there is a note on the map itself and the note reads, "To mitigate flood risk in residential risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures." I have a lot of questions about that, but I guess the first question would be, is it safe to say that the Shaded Zone X is the 500-year floodplain?

Ms. KNIGHT. No, sir. The Shaded Zone X represents what would happen would there be a failure of the levee, in this case. It also indicates to the public that there is a chance of flooding from interior flooding. The event we had that came over West Tennessee and Nashville recently was an unusual event. Had it stopped a little short, there could have been an opportunity for flooding inside that levee, between the St. Francis and the Mississippi Rivers. So we want people to be aware that there is a risk of overtopping or there is a risk of interior flooding. But FEMA does not mandate any codes or, in fact, we don't issue any land ordinances or building codes and it is not required in Zone X.

Senator PRYOR. OK. Well, in the map itself, on the legend of the map where it has Zone X and it tells you what that means, it says areas of 0.2 percent annual chance of flood. Isn't that the 500-year floodplain?

Ms. KNIGHT. There are several designations for Zone X. That particular piece on the legend, I would have to get back to you on that, because there are several designations for Zone X.

Senator PRYOR. OK. It also says areas of 1 percent annual chance of flood within average depths of less than one foot or with a drainage area of less than one square mile in areas protected by levees from 1 percent annual chance of flood. So does this mean——

Ms. KNIGHT. Oh, that is an area protected by a levee from 1 percent, which is the minimum standard. Certainly, as was discussed earlier, perhaps Mississippi River and Tributaries (MR&T) or the Mississippi River levees may have a higher level of protection. But our minimum to look at certification is the 1 percent.

Senator PRYOR. All right. I have some follow-up questions on that.

Ms. KNIGHT. OK.

Senator PRYOR. We don't have a lot of time, but I will submit those for the record. But I do have another question about the Flood Insurance Program, and that is the way you set your premiums. If someone is in the Shaded Zone X area and they decide to buy insurance, or what I think is likely to happen, the mortgage company or their homeowners' insurance company would require them to purchase insurance because of this note on the map and because they are in a shaded area on the map, how is that premium set?

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Ms. KNIGHT. It is an actuarially-based premium. All our premiums are. They reflect the risk taken by the Federal Government to provide that insurance. The question—and I think we have some data here today on some of what the dollar figures are for those policies. Lenders—we do not mandate that the insurance be purchased in that zone. A lender may do that. It has not been our experience that is widely done, because the lending institutes are very competitive and honestly would like to get the mortgage—be able to persuade the homeowners to use their institution for the mortgages.

Senator PRYOR. Yes. Didn't you say earlier that the flood maps are, Flood Insurance Maps are referenced more than 30 million times a year? I assume that is largely by financial institutions that are doing title searches, etc.

Ms. KNIGHT. It is by individual homeowners. It is by community officials. It is by all sorts of stakeholders and people that are engaged. So it is not just lenders.

Senator PRYOR. So you said earlier that if you have a 30-year mortgage and you are in a 100-year floodplain, you have a 26 percent chance of a flood during the life of that mortgage. What is it if you are in the 500-year floodplain with a 30-year mortgage?

Ms. KNIGHT. I actually don't have the number off the top of my head, but I actually saw something. There is a nice chart on American Society of Civil Engineers (ASCE's) website that kind of gives you the different probabilities for each frequency flood.

Senator PRYOR. And do you get a——

Ms. KNIGHT. It is somewhat less than that.

Senator PRYOR. Do you get a lower premium based on that?

Ms. KNIGHT. The premiums are based on the zones themselves, so depending on how the zone is classified. We map the risk, but the Flood Insurance Rate Maps are done by zones. And within each zone, those rates are variable, depending on depth and depending on proximity and that sort of thing and what kind of home it is. It is very individual based on the home itself or the building itself.

Senator PRYOR. You have several different premium levels, is that right?

Ms. KNIGHT. Yes, sir.

Senator PRYOR. Well, I do have a lot more questions, but I don't want to intrude on my colleagues' time, so I may just submit those for the record.

Senator LANDRIEU. Well, I can say, as I recognize the Senator from Montana, that no matter what zone you are in, most of our constituents think they are paying too much for flood insurance. And, of course, flood insurance only covers up to $250,000 of a home. There are many, many homes in the United States that are valued at much more than $250,000 that have to go to the private market, and so that is on top of the premiums that are paid and it gets back to the question of are your maps boundary maps or are they elevation maps, and you can actually see structures within shaded zones, or non-shaded zones, that there is an advantage or disadvantage structure by structure.

But, Senator Tester, your turn for questions.

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Senator TESTER. Yes. Thank you very much. We have a lot of questions and so I appreciate the opportunity and thank you both for being here.

I just want to touch very briefly on the CTP funds.

Ms. KNIGHT. Yes.

Senator TESTER. How much are those grants for? What are they capped at?

Ms. KNIGHT. It is based on scope of work, and I don't know——

Senator TESTER. Is there a cap?

Ms. KNIGHT. No.

Senator TESTER. OK. And those amounts can be used for technical outreach work, various works like that.

Ms. KNIGHT. Yes, sir.

Senator TESTER. Do you have any money for certification of levees or is that not within your purview?

Ms. KNIGHT. No, sir. It is not in our purview.

Senator TESTER. OK. Secretary Darcy, I appreciate you being here and I am feeling like you need some questions, so here we go. [Laughter.]

Ms. DARCY. Thanks for asking.

Senator TESTER. No problem. There are thousands of miles of levees, and I think it was in Sandra Knight's testimony, that were constructed mostly by the Army, or mainly by the Army Corps of Engineers. Before January 2008, the Army Corps did inspections. In fact, the town of Missoula, shortly before January 2008, had their levee inspected by the Army Corps of Engineers. Since that point in time, though, the agency doesn't do it anymore. This puts small rural communities that don't have a lot of population base to spread out funding in a very precarious situation because of the certification of levees. Could you give me some insight into why that policy was changed?

Ms. DARCY. Senator, the policy change came before I did, but I think the intent of the policy change basically was because of the funding. We were focusing our funding on levee safety and not certification, and the levee certification is, as we have said, is a local responsibility. If a Corps of Engineers levee has been built by the Corps of Engineers and is maintained by the Corps of Engineers, it is their responsibility. If the Corps of Engineers has built the levee and turned it over to the local sponsor under a cost sharing agreement, then part of the operation and maintenance of that is the local sponsor's, so——

Senator TESTER. Got you. Doesn't the Army Corps still do annual and periodic inspections of those levees——

Ms. DARCY. We do inspections—

Senator TESTER [continuing]. Even if they do turn them over to a local entity?

Ms. DARCY. Yes, sir.

Senator TESTER. Why can't they just take that to the next step and do the certification?

Ms. DARCY. The inspection information is given to FEMA, and for the purposes of floodplain accreditation, that information can be used for that. But it is an evaluation and provision of information.

Senator TESTER. Thanks for that piece of information. So why don't you use that information for determining the flood?

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Ms. KNIGHT. Sir, we do. We use all the information the Corps gives us.

Senator TESTER. OK. So why are we requiring a certification?

Ms. KNIGHT. It is required by the law in 1986 that we do that, and there are some standards in there that say that we have certain things to provide.

Senator TESTER. OK. Let us bounce back then. So why can't we take the extra step to say it is certified?

Ms. DARCY. When we do an inspection, we do annual inspections and we do periodic inspections——

Senator TESTER. Yes——

Ms. DARCY [continuing]. And again, these are of Corps-constructed levees, only 14,000 miles of the 100,000 or more miles of levees in the country. So it is a limited universe that we have. And when we do our inspections, we do an annual inspection, which is we walk up and down the levee and it is visual and we give that information to the local sponsor and FEMA.

Senator TESTER. Right.

Ms. DARCY. Then we do a periodic inspection, which we do every 5 years, which is a more detailed inspection. However, that inspection is not—the sort of checklist that we have on our periodic inspections does not include all of those requisites that need to be done for a——

Senator TESTER. So what additional information needs to be collected to meet that?

Ms. DARCY. There is additional engineering information that needs to be collected. That is in addition to what a regular inspection that we do would involve.

Senator TESTER. OK. The Army Corps in 1987 used risk-based analysis caused—use of risk-based analysis—let me be clear—caused a disconnect with FEMA, FEMA's numeric freeboard standard. The disconnect made the standard Army Corps data unsuitable for FEMA certifications. In that case, the two agencies were able to come to an agreement so that the data was usable by both sides. Have your two agencies attempted to come to an agreement on data of inspection of levees, because I think you have two different standards. If I am incorrect on that, correct me.

Ms. DARCY. Senator, it is not incorrect. What it is, is that the checklist that FEMA has in order to have a levee evaluation for their program to be in the NFIP program——

Senator TESTER. Yes.

Ms. DARCY [continuing]. Has more requirements than what we have in our periodic inspection.

Senator TESTER. OK. And there is no way to get those two to match up?

Ms. DARCY. I am not saying there isn't a way. I think that, as I say, it is additional requirements and we view those requirements as operation and maintenance level of responsibility.

Senator TESTER. OK. Administrator Knight, in the last few months, FEMA has announced a number of changes to attempt to help struggling communities transition to their new flood maps. We appreciate that. One of the struggles faced by communities and homeowners in a new Special Flood Hazard Area, similar to what the Senator from Arkansas talked about, are faced with sudden un-

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anticipated expenses, $1,700 a year. The tremendous financial drain is not a part of their household calculations and puts them in a heck of a bind.

Senators have expressed their support for at least a phased-in premium for residents of areas that are newly mapped in the floodplain. While FEMA has not put such a policy in place, and correct me if I am wrong on that, I appreciate the attempt to use an extended referral risk policy to grant relief to some of those residents. One of the most important elements of this new policy is that it is retroactive to when many of the new maps from the Map Modernization Program began to go into effect. I am getting somewhere with this. This allows communities who are already struggling with new insurance rates to better handle the shift.

Another concern that many communities have is the appeals process for disagreements with FEMA findings. Last week, FEMA proposed—you probably know where I am going now—proposed an impartial third-party arbitration panel for resolving scientific disputes that cannot be resolved through the existing appeals process. However, this proposal, this one is not retroactive, so it is unavailable to any community that feels their appeal was wrongly rejected but for whom the new flood maps have already gone into effect. What will FEMA do for the communities that are already living with new flood maps that they disagree with?

Ms. KNIGHT. Well, sir, there is a lot of discussion in there. First, I would like to start with the graduated rate proposal.

Senator TESTER. Yes.

Ms. KNIGHT. That is not in our statutes to do that, but we support that and we——

Senator TESTER. I appreciate that.

Ms. KNIGHT [continuing]. The Administrator has come on board to say that we do support that.

Regarding the Scientific Resolution Panel——

Senator TESTER. Yes.

Ms. KNIGHT [continuing]. We think it is a great way forward and we appreciate that——

Senator TESTER. As do I.

Ms. KNIGHT [continuing]. You are supportive.

Senator TESTER. So why don't we make it retroactive?

Ms. KNIGHT. So the retroactive piece is that for communities that use these flood maps to make decisions in their communities, these maps are already in place, and as many folks that come into the maps go out of the maps as they are updated and improved. And so to go back and change that could change a lot of activities that communities are doing to reduce their risk in their communities.

Senator TESTER. But you do understand that without it being retroactive, this doesn't help the folks who have already been placed into a new scheme.

Ms. KNIGHT. If they are placed—we resolved many of the appeals. We have had 275 appeals out of 92,000 map panels, which is pretty good, but there still is an opportunity. We have a map change process——

Senator TESTER. OK.

Ms. KNIGHT [continuing]. And so any community that feels like their data is still not correct, there is a map revision process——

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Senator TESTER. Good.

Ms. KNIGHT [continuing]. That they can submit to FEMA and we will update the maps.

Senator TESTER. And that process includes what?

Ms. KNIGHT. It includes—there is a list of data that they have to provide, much like the appeals, that demonstrates that it is new, improved data.

Senator TESTER. OK. Well, I have a town called Miles City that is in a heck of a quandary over this and we were hoping this Appeals Panel could help them, but it is not retroactive, so they are out of luck. So if it was possible——

Ms. KNIGHT. They can submit a map revision, a request for map revision.

Senator TESTER. OK. All right. One more question, real quick. It doesn't have to do with this, but as long as we have the Army Corps here, I have to do this, so a little bit—I want to talk a little bit about some cabin transfers on Fort Peck Lake.

For 10 years, Congress has allocated the Army Corps $3 million to perform these conveyances. Right now, I understand the Corps is charging potential buyers and owners up to $10,600, to be exact, in administrative costs to get these transferred, triple the administrative costs for similar transactions in the private market. Let me tell you, when I get people from the private sector coming up to me and telling me that Government isn't efficient, it is hard for me to argue when—and I just got another, if it gets through the process, $1 million for cabin conveyances in appropriations, and we are still charging this kind of money.

The good Senator from Arkansas said when his constituents aren't happy, he is not happy. My constituents are not happy, and I can't tell them—I can't give them any reason why this is happening.

I will tell you that for $3 million, you could probably buy a fair number of the cabins around Fort Peck Lake. What is going on?

Ms. DARCY. Well, Senator, in anticipation of your question, I did ask staff to look at the administrative expenses that you refer to, and you are right, that it is anywhere between $9,000 and $10,600, and we have broken down the expenses and a good bit of them, quite frankly, like 36 percent of the administrative expenses are due to our having to evaluate the sanitation conditions for the——

Senator TESTER. But these are all on the same lake.

Ms. DARCY. Right.

Senator TESTER. You can't take a format and move it? It would seem to me—this is $10,600 in addition to the $3 million.

Ms. DARCY. Correct. That is what—but that is what they would have to reimburse the Corps for the administrative expenses, correct.

Senator TESTER. But Congress—do you understand what I am saying? Congress has allocated $3 million, plus we are dinging the owners $10,600 in addition to that. This is a ton of dough for cabins that, truthfully, I don't know how many cabins are on Fort Peck Lake, but you could probably, if you are talking not the land but the cabin, you could probably buy a fair number of those cabins for $3 million plus $10,600 for every property.

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Ms. DARCY. I know that these estimates are based on the 119 cabins that are in the Fort Peck Parcel.

Senator TESTER. Yes.

Ms. DARCY. I will—it does sound like a lot of money——

Senator TESTER. It is.

Ms. DARCY [continuing]. And——

Senator TESTER. You could buy a fair part of Chouteau County for $3 million. I mean, it is a lot of money. It is a lot of money. Take it back to the brass. I thank you, if you would, and I appreciate both of you being here. Thank you very much.

Just in closing, I don't want to go off the levee thing. This baby ain't going away. We have to figure out a way, and I appreciate the work that FEMA and the Army Corps have done together in towns like Great Falls, but we have to get this fixed because we are breaking people. Thank you.

Senator PRYOR. [Presiding.] Senator Collins.

Senator COLLINS. Thank you, Senator Pryor.

Ms. Knight, let me start first by thanking FEMA for responding to my request and working with the City of Portland to come up with a more accurate flood map. It turns out that FEMA's baseline wind and wave measurements are not appropriate for Casco Bay because it has so many islands and ledges and peninsulas that change the flooding from what would be predicted using your models. So we had an acceptable outcome when it comes to the City of Portland, but the problem is that the city had to spend $10,000 to hire a consultant to do the kinds of specialized modeling.

There are now some two dozen coastal communities in Maine that are going through the same process. When the Portland Press Herald interviewed FEMA officials about why they were not doing the more sophisticated modeling, FEMA replied that it lacked sufficient funding to perform the more detailed floodplain modeling that the City of Portland paid for and that these other communities are paying for.

That prompted me to take a look at the budget that FEMA has for flood map modernization, and last fiscal year, the President's budget request was $220 million and Congress fully funded that amount. This year, however, the administration's budget request is only for $194 million. That obviously is $26 million less. That is more than a 10 percent cut. Did FEMA ask for more money and get turned down?

Ms. KNIGHT. I can answer that. Actually, Senator, the cut was because of efficiencies in our program management and a new system for information technology (IT) that helped us save some dollars.

Regarding the technical pieces of it, there will be no downgrade to the technical approaches we take.

And I would like to comment, if I can, on your discussion about the technical levels of detail. We certainly recognize coastal areas, as Senator Landrieu stated, are challenges, and there certainly are different types of models and data that are important in different regions, depending on the topography and the conditions. And for the Portland area, what we really appreciated was, in addition to the community reaching in and updating their model, was the data itself, because the wind data drives the coastal models.

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So we have a new source of wind data that we will certainly be using in the rest of the maps in your State and we also encourage throughout the process, before we get to appeals, that the community partner with us with whatever data they have. So to minimize any expenses to the community, we would gladly take any data that you have.

To administer the balance of the program across the United States and the map we had up there earlier, it really does take that we have a base set of data that we use and a base kind of model that we start with. If we can get better information, we certainly use it. We certainly take advantage of any data the other agencies have or the State has.

Senator COLLINS. Are you using better data, for lack of a better word, as you look at the rest of the coast, learning from the experience in Portland?

Ms. KNIGHT. I can tell you, as we roll out with our next generation map that we will definitely be looking at upgrading the science, and that is our version called Risk Map. For the maps that we have now, we have a plan that we work with the communities and do the basic things, and a lot of communities that have had more data, we have used more sophisticated information. It would be nice to have real granular data everywhere and it is simply not available at this point.

Senator COLLINS. But, see, that is exactly the problem. It is shifting the burden onto the coastal communities in York and Cumberland Counties to spend the money for consultants to produce this data, and that is expensive and a lot of these communities are cash strapped right now due to tough economic times, and we have communities like Harpswell, for example, which, believe it or not, has 200 miles of coast, even though it is a very small community, just because of the way Maine's coast is. There are so many little bays and inlets. We have the town of Kennebunkport. It is projected that two-thirds of Kennebunkport would be placed in a flood zone. That is a 50 percent increase from the current flood map.

The implications for new development, as the Chairmen have both indicated, for the cost of flood insurance, are enormous both for individuals and for the community, and that is why I feel so strongly that the financial burden of providing the data that would lead to the most accurate possible flood maps shouldn't fall on the communities. It should be FEMA's responsibility.

Ms. KNIGHT. Well, to have the level of data in every community on every map would far exceed the budget that we have to work with because of the level of data that it would take to do that. And again, in places we have it and opportunities where we can work with, through cooperative technical partnerships, then you can provide that data. You can provide it to us anyway, but we can work with you and give you funds to help do that if you have a technical source that understands your situation better. Those are the vehicles right now that we use. As we do the next generation maps, where we are looking at where the highest risks are and where that precision needs to be improved. We will be able to step up some of the engineering tools and some of the data tools there.

Senator COLLINS. Well, I would ask that you continue to work with me and the other Members of this Subcommittee——

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Ms. KNIGHT. We would be glad to.

Senator COLLINS [continuing]. To help communities tap into that funding source, because for a community to have to spend tens of thousands of dollars to produce data to challenge these maps is really difficult during these tough economic times. Thank you.

Senator LANDRIEU. Yes, and I would just add that it would seem to me a more reasonable approach would be to develop the maps together, in sort of a not adversarial, but in a partnership, because that is what this is. It is a partnership to keep our communities safe and to do it in the most affordable way.

I would like to ask—this has been a very good panel. I hope you can all stay to hear the second panel, because we have to move to our second panel, and I would like to introduce just one member of that panel and then turn it over to Chairman Pryor to introduce the others.

But we thank you for your testimony. We are going to follow up. We have just scratched the surface here, the tip of the iceberg. We have many follow-up questions and I am going to ask the Members to submit those for the record. But thank you all very much.

If the other panel will come forward, Dr. Suhayda is the Interim Director of the Louisiana State University Hurricane Center. He recently chaired the Independent Technical Review committee of the Joint FEMA–Corps of Engineers Storm Surge Study. We are looking forward to his testimony.

If the others would please take their seats, Senator Pryor, to keep us moving, will introduce you as you are seated. And again, thank you all very much. Senator Pryor.

Senator PRYOR. Thank you, Madam Chairman. I will go ahead and introduce this panel as our staff sort of swaps out the nameplates and resets the microphones, etc. I will be very brief in my introduction, and I am going to introduce three of the panelists. Senator Landrieu has already introduced one. And then Senator Tester will introduce the fourth.

But I would like to begin by introducing Dr. David Maidment. He is Director of the Center for Research in Water Resources and Chair in Civil Engineering at the University of Texas in Austin. He served as Chairman of the National Research Council's Committee on Floodplain Mapping Technologies and FEMA Flood Maps.

Our next witness is Sam Riley Medlock. She is Policy Counsel for the Association of State Floodplain Managers and a member of the National Committee on Levee Safety. Ms. Medlock has over 18 years experience working on hazard mitigation and environmental policy.

And finally, I would like to introduce Rob Rash. He is the CEO and Chief Engineer of the St. Francis Levee District in Arkansas. Mr. Rash is responsible for all operations of the St. Francis Levee System, which extends in Northeast Arkansas and covers seven counties with 235 miles of levee.

And Senator Tester has the last introduction.

Senator TESTER. Well, thank you, Chairman Pryor.

It is my pleasure to introduce Representative Bob Mehlhoff. Bob made a career out of being a math and science teacher. After that, he ran and was elected to the State legislature, the State House from the West side of Great Falls, where one of the levee problems

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exists right now, so he can give us an on-the-ground view of it. He is a decent guy and a fair softball player. [Laughter.]

Thank you, Mr. Chairman.

Senator PRYOR. Alright. Great.

Well, since we are all set up here, Representative Mehlhoff, why don't we start with you and go ahead and give your testimony. And I think we would like a 5-minute opening statement. If you could limit your statements to 5 minutes, that would be great. And, of course, all of your written statements will be placed in the record.

TESTIMONY OF THE HON. ROBERT MEHLHOFF,[1] DISTRICT 26, MONTANA HOUSE OF REPRESENTATIVES

Mr. MEHLHOFF. Thank you, Senator Pryor, for inviting me here, and Senator Landrieu, and also Senator Tester, thank you for your kind comments about my softball ability. [Laughter.]

My name is Robert Mehlhoff and I am a State Representative from District 26 in Montana. I represent the West Great Falls Flood Control Drainage District and also the Vaughn Small Drainage District.

For the sake of time, I will quote statistics from Great Falls Levee only. The Vaughn Levee is smaller, but has proportionately fewer properties.

The Great Falls Levee System is a 7.65-mile project. It is designed, engineered, and constructed by the Corps of Engineers and was completed in 1987 at a cost of over $10 million Federal and $2 million local. The levee has been inspected annually by the Army Corps and has passed every annual inspection. A periodic or 5-year inspection was just completed, but we have not received the results yet. We anticipate no problems in that particular inspection, however.

Now the Flood District has been told that in addition to the Army Corps' inspections, there will be new and costly requirements from FEMA for levee accreditation from the National Flood Insurance Program. At about the same time Great Falls learned that FEMA will require accreditation for the levees, we also learned that the Army Corps no longer performs these accreditations. Without the Corps, the communities alone will have to bear the cost of private engineering firms to conduct this expensive study.

Since the levees were built, the Corps of Engineers have accepted responsibility to ensure levee safety. In fact, other levees in Montana have been certified by the Seattle District, as was stated earlier by Senator Tester. The Army Corps and FEMA's cooperation that had worked for decades no longer exists and the losers are the levee districts that will be forced to pay for these additional requirements.

The levee districts in Great Falls and Vaughn are small, sparsely populated, and low-income areas. All together, there are approximately 1,000 properties behind the nearly eight miles of levees. Great Falls and Vaughn simply do not have the population or the tax base to pay for these increased FEMA requirements without the help of the Corps. As if there wasn't enough, we are told that they may have to redo these expensive studies every 5 to 10 years.

[1] The prepared statement of Mr. Mehlhoff appears in the appendix on page 62.

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FEMA has asked Great Falls, the flood district, Cascade County, to enter into a Provisionally Accredited Levee Agreement, the PAL, with FEMA. The PAL would obligate the community to accept full responsibility for levee certification and the costs that come with it, and it would set a deadline of 2 years for the completion of certification process. If we do not sign a PAL agreement, our levee will be de-accredited as soon as FEMA's new maps go into effect. The flood insurance will become prohibitively expensive for my low-income and moderate-income constituents. We cannot afford the cost to pay a private engineer to certify the levees, and we cannot afford the flood insurance if we do not complete the certification process. This dilemma is having a devastating effect on our area.

I appreciate that the fact that FEMA and the Army Corps have at least come to Great Falls to do some community outreach, and we are grateful to Senator Tester for his work to help bring representatives from these agencies to hear firsthand from the community. But the fact remains that for Great Falls and many other small cities and many other towns in our country, we do not have the resources to fund our own levee accreditation required by FEMA, and it should not take the personal intervention of a U.S. Senator for FEMA and the Army Corps to work together to hear from folks and to come up with some decisions.

Because of the economy, folks in my district are having a difficult time making ends meet. Many families could lose their homes if large unanticipated costs are added to their monthly expenses. People who want to sell their homes are finding fewer prospective buyers willing to take a chance to purchase a home in the affected area.

We had over 800 people show up, many in a Montana blizzard with chill factors well below zero, to sign a request of our Congressional delegation to find a solution. That is the degree of concern that is out there.

We have had many meetings and conferences called with the Corps and FEMA. We feel that the buck keeps getting passed back and forth and we are not getting definite answers on what Corps data can be used in the certification process. A decision on what data can be used is essential to determine what FEMA certification will cost our local community.

We need the Army Corps and FEMA to sit down, go through our data, and determine if there is sufficient data for the two agencies to certify our levee. The Army Corps of Engineers needs to represent our interests in this process. Essentially, our levees exist today as they did the day they were built. We cannot understand why the Corps of Engineers will not or is not allowed to stand by their work.

I would be happy to answer any questions. I have some solutions that I have submitted and I would be more than thankful that you guys did give us this opportunity, and I will submit any information you request.

Senator PRYOR. Thank you very much, and before we move to the next witness, would you like to comment on Senator Tester's softball ability? [Laughter.]

Senator TESTER. That is out of order, Mr. Chairman. [Laughter.]

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Mr. MEHLHOFF. A great third baseman. You don't want to be anywhere around where that ball comes in from third base and incoming to first base.

Senator PRYOR. There you go. Good. Dr. Maidment.

TESTIMONY OF DAVID R. MAIDMENT,[1] DIRECTOR, CENTER FOR RESEARCH IN WATER RESOURCES, AND HUSSEIN M. ALHARTY CENTENNIAL CHAIR IN CIVIL ENGINEERING, THE UNIVERSITY OF TEXAS AT AUSTIN; AND CHAIR, COMMITTEE ON FLOODPLAIN MAPPING TECHNOLOGIES, AND CHAIR, COMMITTEE ON FEMA FLOOD MAPS, NATIONAL RESEARCH COUNCIL, THE NATIONAL ACADEMIES

Mr. MAIDMENT. Good afternoon, Chairman Landrieu and Chairman Pryor, and Senator Tester and Members of the Subcommittees. Thank you for the opportunity to testify today. It is an honor and privilege to do so.

My name is David Maidment and I am the Director of the Center for Research in Water Resources at the University of Texas at Austin. I chaired two National Research Council Committees concerning FEMA's floodplain maps. References to these reports and more detailed arguments than I will present today are contained in my written testimony. My testimony today addresses the accuracy of FEMA floodplain maps.

FEMA has undertaken an ambitious program to provide the Nation with coverage of digital Flood Insurance Rate Maps. The first phase of this program, called Flood Map Modernization, operated from 2003 to 2008, and a subsequent phase, called Risk Map, is now in operation. The Committees that I chaired assessed flood mapping practices during the Flood Map Modernization period. I will begin with the work of the Committee on Floodplain Mapping Technologies.

During the annual appropriations hearings for Flood Map Modernization, concerns were expressed to Congress that the underlying framework data used as input to the flood mapping progress were not of adequate quality in much of the Nation to properly support the creation of new digital flood maps. The underlying framework data consists of two components: First, land surface reference information that describes streams, roads, buildings, and administrative boundaries; and second, land service elevation information which defines the topography or shape of the land's surface. The Committee concluded that the land surface reference information, which is derived from regularly updated aircraft imagery, is adequate to support floodplain mapping. The land surface elevation information is, however, more questionable.

The main source of land surface elevation information is the National Elevation Dataset (NED), which is derived from contour information in U.S. Geological Survey (USGS) 1-to-24,000 scale topographic maps which were made over a long period and have an average date of 1970. FEMA's floodplain mapping standards call for elevation data that is approximately 10 times more accurate than the data in the National Elevation Dataset. This means that the

[1] The prepared statement of Mr. Maidment appears in the appendix on page 64.

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National Elevation Dataset is too old and inaccurate to use for floodplain mapping.

The committee concluded that a new National Digital Elevation Data Collection Program (NDEP), which it named Elevation for the Nation, is required, and that light detecting and ranging (lidar) should be the primary technology for acquiring digital elevation data. The data arising from Elevation for the Nation might have many beneficial uses beyond floodplain mapping and management.

Following completion of that study, FEMA and National Oceanic and Atmospheric Administration (NOAA) asked the National Research Council (NRC) to conduct a further study on flood map accuracy and the Committee on FEMA Flood Maps was formed. Key components of the uncertainty of flood mapping are hydrology, how large is the flood flow, hydraulics, how deep is the floodwater, and topography, what is the elevation and shape of the land surface.

In collaboration with the North Carolina Floodplain Mapping Program, the committee carried out detailed case studies to compare hydrologic, hydraulic, and topographic uncertainties in three physiographically significant mountain areas: The mountainous west of North Carolina, the rolling hills in the Piedmont Region of North Carolina, and in the very flat coastal plain. We chose North Carolina for these case studies because the State had already collected lidar data Statewide to support its flood mapping efforts.

Now, I might also add that North Carolina's flood maps are the best in the Nation. In my own State of Texas, half of the counties have no digital floodplain maps.

The committee concluded that the largest effect by far on the accuracy of the flood maps is the accuracy of the topographic data. A comparison of light detecting and ranging (lidar) data and the National Elevation Dataset around three North Carolina streams revealed random and sometimes systematic differences in ground elevation of about 12 feet, which significantly affects predictions of the extent of flooding. These large differences exceed FEMA's stated error tolerances for terrain data by an order of magnitude.

As Risk Map develops, there has been a significant policy shift by FEMA to emphasize collection of better land surface elevation information as a precursor to further floodplain mapping activities. FEMA is also moving from simply showing where Flood Hazard Zones are to communicating flood risk for individual structures by adding other information such as the depth of flooding to the maps. The resulting flood maps should be more accurate and informative and should address the concerns with land surface elevation information identified by the National Research Council Committees.

Thank you again for the opportunity of testifying today. I will be happy to address your questions.

Senator PRYOR. Thank you. Ms. Medlock.

TESTIMONY OF SAM RILEY MEDLOCK,[1] POLICY COUNSEL, ASSOCIATION OF STATE FLOODPLAIN MANAGERS, AND MEMBER, NATIONAL COMMITTEE ON LEVEE SAFETY

Ms. MEDLOCK. Thank you. My name is Sam Riley Medlock. I represent the Association of State Floodplain Managers. First, we

[1] The prepared statement of Mr. Medlock appears in the appendix on page 69.

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thank Chairman Landrieu, Chairman Pryor, Senator Tester, and the other Members of these Committees for your attention to the issues related to our Nation's flood risk and levees.

Association of State Floodplain Managers (ASFPM) and its 29 chapters represent more than 14,000 State and local officials and others who are the Federal Government's partners in the national effort to identify and reduce the loss of life and property in floods.

Today, my testimony addresses the challenges and opportunities at the nexus of levees, flood maps, and flood insurance. By holding this hearing on both levees and maps, the Subcommittees recognizes the relationship between these two issues, that they are intertwined. ASFPM appreciates that recognition and would further add the interrelation of flood insurance.

Because of concerns about flood insurance as an added cost, we are now hearing calls to withhold maps, keep risk under wraps, and pour more Federal money into flood control structures as the only approach to dealing with flood hazards, despite their demonstrated limitations and the residual risk that exists behind levees. In fact, we must recognize that areas behind levees are at risk from flooding. Although some may deny that risk, resist safety notices on maps, argue that their levees will never fail, and that folks behind those levees do not need flood insurance, the simple fact is that those areas behind levees are at risk and the American people have a right to be informed of that risk and be given every opportunity and tool to prepare themselves for the next flood.

The problem with these elements—maps, levees, and flood insurance—have crystallized to create an important opportunity for all of us this afternoon and through the National Policy Dialogue to identify ways to better manage flood risk. Today, at least four significant policy initiatives are underway that can lead to a more complete and integrated flood risk management approach for the Nation.

One is the National Committee on Levee Safety that was mentioned earlier by Secretary Darcy. This Committee on Levee Safety was created by the Water Resources Development Act of 2007. The committee has completed its report to Congress and is in the process of developing legislative recommendations. I represent the ASFPM on that committee.

Additionally, FEMA Administrator Craig Fugate has launched a comprehensive initiative to reconsider or rethink the National Flood Insurance Program, actively seeking bold ideas. We look forward to hearing back from FEMA on that initiative with substantive recommendations for policy and even legislative reform in the next couple of years and urge your timely attention to that when those recommendations for reform come through.

Additionally, the administration recently reestablished the Federal Interagency Floodplain Management Task Force (FIFMTF), which had been dormant for 15 years but has great potential to unite the Federal family, not just Corps and FEMA, but also those agencies that put tremendous Federal resources behind levees.

And then, last, the Council on Environmental Quality is working to redesign the fundamental principles and guidelines associated with big national water policy and projects.

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In the time that I have left, I would like to raise three important issues, one being that levees have too long been the sole tool, the biggest tool, the most visible tool that State and local governments and Federal leadership goes toward to manage flood risk. That, combined with the 1 percent or so-called 100-year flood standard, has, if you will, painted State and local government into the situation, into the corner in which we find ourselves today. When you add to that the accreditation, a needed consideration of the state of the Nation's levees along with the requirements under the National Flood Insurance Program, we recognize that there are real concerns that communities have and that families and businesses have with that flood insurance requirement and would point to some very bold initiatives and ideas that are emerging from this national dialogue.

For example, levee districts could obtain group flood insurance policies to protect every property owner or structure in that leveed area, pool those premiums, but it would also engage those policy holders in the health and maintenance of that levee in order to keep premiums affordable. Additionally, that same approach could be used by communities.

In closing, we would request permission to submit more detailed comments into the record after today's hearing and look forward to answering your questions.

Senator PRYOR. Thank you.

Mr. Rash, I know that you have someone else who is with you from the Mississippi Valley Flood Control Association, George Grugett. I know you wanted me to recognize him, but go ahead. We would love to hear your testimony.

TESTIMONY OF ROBERT G. RASH,[1] CHIEF EXECUTIVE OFFICER AND CHIEF ENGINEER, ST. FRANCIS LEVEE DISTRICT OF ARKANSAS

Mr. RASH. Yes, sir. Thank you. Madam Chairman and Mr. Chairman, other Members of the Subcommittee, Senator Tester, I would like to thank you for the invitation to be here today. Thank you very much. And I would like to discuss the concerns that we as local citizens have with the FEMA Flood Map Modernization process.

My name is Rob Rash and I am the Professional Engineer currently serving as the Chief Executive Officer and the Chief Engineer of the St. Francis Levee District of Arkansas. Our headquarters are in West Memphis, Arkansas, and I maintain 235 miles of levee, 160 miles of Mississippi River mainline levee and 75 miles of St. Francis Basin tributary levees. It may be important to note that our district began in 1893, and so we have been around quite some time.

These levees are part of the Mississippi River and Tributaries Flood Control Project, which contains a total of 3,787 miles of levees, along with other structures, such as flood walls, reservoirs, pumping plants, floodplains, diversions, and every other proven method to prevent flooding from the 41 percent of the waters of the United States that flow to the Gulf of Mexico.

[1] The prepared statement of Mr. Rash appears in the appendix on page 77.

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Since the MR&T project is a unique, one-of-a-kind Federal flood control project, let me say that the law that established this project states the project for flood control of the Mississippi River and its alluvial valleys is adopted and authorized as set forth and recommended in the report submitted by the Chief of Engineers in House Document 90. That document states that the flood used to design this plain is predicted by the Weather Bureau as the maximum possible and by the Mississippi River Commission (MRC) as the maximum probable flood.

For the sake of time, I have not quoted the law nor the document exactly or in their entirety. It may be well to partially quote a little more of the law that says that the works and outlets constructed under the provisions of this Act shall be built in a manner and of a character which fully and amply protect the adjacent lands. This law and this project has served the country well, because for the last 82 years, no project levee built to MRC standards has ever failed, despite major floods in nine of those years, some of those record proportions.

As I am sure, the flood maps are not new to us. The thing is that the new fact of the flood maps is the area behind the levees, within the boundaries of the St. Francis Levee District of Arkansas, were shown as a Zone X on the old maps and are now shown as a Shaded Zone X. The Zone X was a 500-year level of protection, which was adequately shown, as you show here, Senator Pryor. We are now in a Shaded Zone X area which does not mandate flood insurance but strongly recommends it. This recommendation and history show us that when a Federal entity requests or recommends flood insurance, Federal mortgage companies follow suit.

The millions of citizens and those that now inhabit the alluvial valley of the lower Mississippi River have paid levee taxes for over 100 years. They consider that these taxes have been paid in lieu of flood insurance. The levee taxes are collected and expended by the levee boards to finance the day-to-day operations and maintenance of these levees and is of great concern to us and the citizens of the valley that are not going to pay flood insurance and levee taxes. The local people's investment in our local levee system since we began building them in the early 1800s is in excess of $17 billion, which includes the original levee, the construction of the original levee and the maintenance of these levees for the last 150 years.

In conclusion, my letter of invitation to appear before you asked for my recommendations. My first recommendation will be that FEMA use the best engineering and hydraulic information available in the revisions of the Flood Rate Insurance Maps and that they discontinue the practice of considering that every Flood Protection Area in the Nation as being the same when, in fact, they are different.

FEMA needs to take into consideration what has been done to protect against floods and they also need to consider what the demands for the sale of more and more flood insurance will have on the economy of this Nation. The MR&T deserves a separate designation on all Flood Insurance Rate Maps that clearly state that protection is above the 500-year flood and no insurance is required.

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We are aware of the need that FEMA has to collect funds, but we are also aware of the consequences their present actions will have on the future of this Nation, especially in the rich alluvial valleys that produce so much that is necessary in our day-to-day lives, including, but not limited to, the majority of the food and fiber required for this country.

The Mississippi River is a critical natural resource and one of our Nation's greatest assets. At 2,320 miles, it ranks as one of the largest rivers, supplying 18 million people with drinking water and linking agricultural, timber, coal, and other producers to markets around the world. Each year, the Mississippi River Valley generates more than $12 billion in agriculture and forest products and $213 billion in manufacturing goods. The return on the Federal investment for the MR&T project is 27-to-1. It is the finest flood control project in the country, and I ask that you please recognize that in the flood map updates.

That concludes my statement and I will answer any questions that you may have.

Senator PRYOR. Thank you. Dr. Suhayda.

TESTIMONY OF JOSEPH N. SUHAYDA,[1] INTERIM DIRECTOR, LOUISIANA STATE UNIVERSITY HURRICANE CENTER, AND CHAIRMAN, INDEPENDENT TECHNICAL REVIEW COMMITTEE, FEMA/USACE LOUISIANA STORM SURGE STUDY

Mr. SUHAYDA. Thank you very much. Senator Landrieu, it is good to see you again, Chairman Pryor and Senator Tester. My name is Joe Suhayda. I am the Interim Director of the Louisiana State University (LSU) Hurricane Center. I want to describe some recent experience of the State of Louisiana and the communities within that State as a result of both Katrina and then the remapping effort on the part of the Federal Government, and then the reconstruction of many of the levee systems that are critical to Louisiana.

A lot has been happening in Louisiana. Most of the stories you can tell around the country, I think I can top, but I won't. But we do have a wealth of experience. I did serve as the Chairman of the Technical Review Committee and participated in the preparation of the maps for Louisiana. I also worked with several of the communities when it came to appeal the maps. So I saw how they were prepared and how it impacted the communities. My knowledge that I brought to the process, because I participated in it, was critical to the success that we have so far had in dealing with the appeal process in FEMA.

In terms of the accuracy of the maps, we did find a number of local topographic and bathymetric issues that limited the accuracy of the maps. Senator Collins and Dr. Knight referred to the local effects and the lack of ability to pay for what is needed to be done at the local level. In many cases, we had the data at the local level already.

We had concerns, also, with the mapping of the stillwater, which is part of the coastal evaluation, and the wave heights. The model being used, called the Wave Height Analysis for Flood Insurance

[1] The prepared statement of Mr. Suhayda appears in the appendix on page 80.

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Studies (WHAFIS) model, we believe is not appropriate for Louisiana. We believe the complexity of the coast exceeds the ability of that model. The Corps does not use that model in its own assessment for the levee protections.

We also had questions with regard to the procedural issues. Did FEMA's contractors follow FEMA's guidelines? We felt obliged to follow the guidelines in preparing the appeal. We found inconsistencies when we looked through the details between what the contractor did originally and then what the guidelines were.

As far as mechanisms for resolution, dispute resolution, we have evolved to the point now where, as a result of the involvement of Senator Vitter, there have been a series of meetings set up outside of the normal, I would say, appeal process procedure, where we have met with the technical people that created the maps, the contractors, and related some very detailed criticisms and suggestions for change.

The maps are being changed. I feel like we made a big step forward. My concern is that the accommodation that FEMA has made to our concerns in Louisiana are ad hoc, that the next time we do this, and I will mention that there is going to be a next time, I am not sure that we have a new protocol for dealing with appeal issues. But certainly things are improving in terms of interacting with FEMA.

Levee inspection, I just want to use, and levee certification, a couple of examples. We have had levees that were in the past, in a sense, certified for 100-year protection at a fixed elevation. The criteria changed. Hence, these levees no longer were certifiable. Hence, they are taken out of the analysis of flood protection. So we have communities right now that have had levee protection for a number of years, that had the Base Flood Elevation at three feet. Under the new maps, they have 11 feet, and the irony is, outside the levee system, the stillwater is 11 feet. It is like the levees don't even exist. So the Federal Government and the local community have cost shared on levees that are not included in the analysis.

Plaquemines Parish, we have BFEs in some of the protected areas that are 18 feet, and I just am trying to estimate here. I think 18 feet is close to the ceiling elevation of this room. That is how high the new buildings would have to be built.

In terms of coastal restoration projects and non-levee structures, Louisiana is replete with roadways and railroads and other non-levee structures that should be included in the analysis that get unequal treatment. We have coastal restoration projects that we are planning in terms of barrier restoration, in terms of ridge restoration, that we believe should be treated through a process similar to levee certification so that we could certify these coastal features.

And just to conclude, I do believe that a Cooperative Technical Partnership is the means for preparing the State of Louisiana to take over more responsibility and be more involved, because we will be revising the maps and redoing the area around New Orleans in the 2012 to 2013 time period when the new levees are completed.

Thank you very much.

Senator LANDRIEU. [Presiding.] Thank you.

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Chairman Pryor, I appreciate you allowing me just to make a brief statement. Unfortunately, I am going to have to slip out, but I just wanted to thank our witnesses. I really appreciate your testimony. I was particularly moved by, Mr. Rash, your testimony about the effort that your community has undergone since 1892. I mean, New Orleans will be celebrating its 300th year in 2018, and literally for 300 years, the people of New Orleans and surrounding areas have been building levees and investing millions and millions and billions and billions of dollars, and we have to find a way in this country to honor that and respect the money that the taxpayers have already paid and not require them on top of all that to pay exorbitant insurance rates, as well. I mean, that is the problem.

And under insurance rates now, which I am going to submit for the record, many of my constituents—this started before Hurricane Katrina, but it really came to a head after Hurricanes Katrina and Rita—I cannot tell you the number of people that have come to me and said, "Senator, I can afford my mortgage. I cannot afford my insurance." They are paying taxes to a levee district. They are paying exorbitant insurance rates. And we have to find a better way, whether it is along the Mississippi, for which we are very appreciative and understand it is very unique, the Mississippi River and its tributary system, which you beautifully outlined.

And so, Ms. Medlock, I would just say that I look forward, and I think the Chairman and I both look forward to working with you and your Association to try to find a better way, more community input, more local input, more support for the communities, one size doesn't fit all, honor the money that has already been spent, and try to find an affordable way for this country to have safe communities and peace of mind. And we know that levees aren't the only answer, but when we build them, they shouldn't break or bust or be breached, and we are looking internationally.

I will tell you—I will conclude with this—I hope that Assistant Secretary Darcy will accompany me to the Netherlands, where they protect their people from floods that might occur once every 10,000 years, and they do it in a very affordable manner and they don't have, or haven't had since 1953, a massive flood. We can't seem to be able to afford or find a way to protect our people from one every 100 years and are struggling with the one to every 500 years and have people building 20 feet above the ground. Senior citizens, the disabled community, I mean, they are having serious issues with what is happening to us on the coastal area. I can only imagine, Senator, in your State of Montana and inland in Arkansas.

But this really is a big problem, and I thank Senator Pryor for joining me in this effort. It is not going to be easy, but it is imperative that we find some solutions here for our people. And I thank you and I am sorry that I have to leave early.

Senator PRYOR. [Presiding.] Thank you, Senator Landrieu. Thank you for your leadership, and I am glad you were able to stay as long as you did.

I have a few questions here and I think I would like to start with Mr. Rash. Mr. Rash, you see this map up here of Marion, Arkansas, which is, if I understand it, it is inside your territory——

Mr. RASH. Yes, sir.

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Senator PRYOR [continuing]. The St. Francis Levee District——

Mr. RASH. Actually, my house is on that map.

Senator PRYOR. Is that right?

Mr. RASH. Yes, sir.

Senator PRYOR. How much of your territory that is in the St. Francis Levee District, how much of your territory is in the new Shaded Zone X on the maps?

Mr. RASH. The three counties that are being remapped right now are completely shown in the Shaded Zone X within our district. If all seven counties in our district were remapped, they would all be shown in a Shaded Zone X, at best.

Senator PRYOR. Can you give us a sense of what your experience has been with FEMA and the Corps of Engineers during this process?

Mr. RASH. Senator, we had a meeting—I will go back 2 years ago—that you set up in our office with FEMA representatives to sit down and discuss these very issues about the Shaded Zone X and the delineation of the Shaded Zone X. They listened to our concerns and we did not hear back.

However, we did have a meeting Monday. We did have a meeting Monday with FEMA representatives in Washington, D.C., about the very same issues. The concern is that the actual flood maps are complete in our area. They just have not become effective. But the entire area in Crittendon County within our district is shown as a Shaded Zone X. We have voiced our concerns. We were told Monday that the map will go out as is, and we have some concerns about the delineation, as we have had all along, the delineation of that Shaded Zone X because of the—when you look back at other areas, the 1927 flood, you can see the areas that were submerged and that should follow that Shaded Zone X, which is what we recommended to FEMA.

So our process has been somewhat cumbersome, but they have worked with us recently very well.

Senator PRYOR. OK. Can you tell the Subcommittee here how often local communities in your area face issues of flooding?

Mr. RASH. Senator, I heard mention of the area in Millington and the 10 to 12 inches of rain that they received and were flooded. We received 8 to 10 inches of rain in that time period. We had some homes that were flooded, but certainly nothing from the riverine flooding that is portrayed on these Flood Insurance Maps from the Mississippi River. So we have these 8 to 10-inch rains.

I would like to mention that Cedar Rapids and the effects there in the Northern part of the country, we saw, I think we probably all saw some of the levee breaches there. I want to point out that the Mississippi River and Tributaries Project, it is designed for 41 percent of the continental United States, everything from the Continental Divide in Colorado to the Western tip of New York State and even two Canadian provinces. Any rainfall event that occurs in that area comes right by our house in Arkansas. So that system is set up in a much different dynamic than anything else in the country.

And so my entire concern, and you well know this, the entire concern is that as these isolated flooding events, as occurred in Millington and in Nashville and in other areas, in 41 percent of the

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continental United States, you will have isolated flooding events. However, when it came past our house within the confines of the floodway, within the confines of that, we still had 18 feet of levee remaining as that river crested with the results of all those isolated flooding events.

So it is a different dynamic. It is a different project and we don't feel that FEMA is adequately reflecting that level of protection. I have heard mention of the 100-year level of protection and the 100-year flood and how it is portrayed on the maps. There is nothing that portrays anything from 100 years up, and the areas in our entire district have been taken out of that 500-year flood zone, or 500-year flood protected area and placed in this Shaded Zone X, which gives an element of concern that does not exist.

Senator PRYOR. I have a couple more questions for you, and then I am going to turn it over to Senator Tester, and then I have a few follow-ups with the rest of the panel.

You said in your opening statement that you think the Mississippi River and Tributaries, MR&T, should either be exempted from the flood mapping or at least treated differently.

Mr. RASH. Yes, sir.

Senator PRYOR. Is that why, because of the huge Federal investment and basically because of the track record of the system?

Mr. RASH. Yes, sir. And I understand the need that FEMA has mentioned and that Congress has mentioned of warning people of the risk, and I understand that. We want it accurately warned. I have seen the number on the 26 percent chance of having flood events occur in a 30-year mortgage. That is a blanket probability or statistic across the country. It applies the very same in Denver, Colorado, as it does in the Everglades. And so the difference in the two, it is not taken into account, the protective measures that are there.

And the MR&T has a history of protection and it needs—in my opinion, there needs to be a separate designation that says this area protected by the Mississippi River and Tributaries Project, that would serve the purpose of warning people of the risk of living behind the levee, but it would also say that this area is protected above the 500-year level of protection.

Senator PRYOR. Let me ask one last question to you, and that is on the map that we have there that has the Shaded Zone X, the whole map is shaded gray area, there is that note that encourages people to purchase flood insurance. What is your concern about basically this entire county and other counties like it being in the Shaded Zone X?

Mr. RASH. We had a meeting in West Memphis. It was June 21, 2010, and representatives from FEMA Region VI came to display the flood maps. And even the FEMA representative there in his presentation made this statement, that FEMA is—their minimum standard is to recommend flood insurance in the Shaded Zone X area, but they are finding that the lenders, the mortgage companies, are requiring it. And so our concern was solidified by that statement.

Senator PRYOR. So here you have the problem of people paying their levee taxes——

Mr. RASH. Yes, sir.

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Senator PRYOR [continuing]. Paying for their levee district, paying for the protection, and then also having to pay flood insurance.

Mr. RASH. Yes, sir. And in the MR&T and in our entire levee system, please understand that there is a $13 billion Federal investment in that system and there is a $17 billion investment of local people's money in that system over the last 100 years, 115 or 150, depending on the area you are looking at. So it was noted in the 1928 Flood Control Act that there was no cost sharing to be done by the local people because they had already paid their cost share up front. So the money expended by the local people from 1928 to now is the day-to-day operations and the maintenance on these levee systems themselves, and those are substantial investments.

Senator PRYOR. Senator Tester.

Senator TESTER. As long as Senator Pryor has you warmed up, Mr. Rash, we will keep going.

Mr. RASH. Yes, sir.

Senator TESTER. You said you live up in this area.

Mr. RASH. Yes, sir.

Senator TESTER. When did it change from the diagram on your left to the Shaded Zone X?

Mr. RASH. The map, I believe, becomes effective October 6. We were granted a 90-day extension, so——

Senator TESTER. October 6?

Mr. RASH. Yes, sir.

Senator TESTER. On the map on the left, did you need to buy flood insurance?

Mr. RASH. No, sir.

Senator TESTER. You did not. The map on the right, you are saying the realtors are saying you have to buy health insurance—you have to buy flood insurance?

Mr. RASH. Yes, sir. It is—the indication is that the mortgage companies will require it.

Senator TESTER. Did anything change with the levees?

Mr. RASH. No, sir. As a matter of fact, we have received 58 continuous outstanding maintenance awards from the Corps of Engineers, 58 straight years on those levees.

Senator TESTER. OK. Do you have a loan on your house?

Mr. RASH. Yes, sir, I do.

Senator TESTER. Are you going to have to buy flood insurance?

Mr. RASH. Yes, sir.

Senator TESTER. Do you have any idea what flood insurance is going to cost you?

Mr. RASH. I do not, actually. I was looking at this preferred risk policy, which under that Shaded Zone X and because the levees are certified, we would fall under that, and it states here that for a $100,000 home, it is about $600 per year.

Senator TESTER. OK. Thank you very much.

Mr. RASH. Yes, sir.

Senator TESTER. Before I go on with some questions for Representative Mehlhoff, I do want to say thanks to Secretary Darcy and Dr. Knight for being here for this portion. I very much appreciate you folks sticking around. That speaks well of you.

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Representative Mehlhoff, I appreciate you coming here. As I said earlier, it is a long ways from Montana to Washington, D.C. I also appreciate your tireless effort on this issue for your constituents.

You have seen in the levee certification inspection from a local perspective. Would you please let me know or explain to me what you see as a potential solution?

Mr. MEHLHOFF. Thank you, Senator Tester, for your efforts, too, on this. What I would see from the local perspective that we have is, first of all, we are also—our flood levee system was designed for a 500-year flood, and we have had very little change in our area over the years. Like, some areas have an awful lot of new development. Ours looks about like it did 50 years ago. So we have had very little change upstream. In fact, modern farm practices with no-till farming is holding the moisture even more in place, which should result in even less chance of runoff in the spring.

But what I see as a solution to this is the Corps of Engineers needs to take over responsibility for levee certification. The Corps has the data all the way back to the construction of our two levee systems in Cascade County, plus data from annual and periodic inspections.

Second, when the annual and periodic inspections are completed, the Army Corps should require their contractors to collect enough data to meet FEMA's certification requirements. That would result in a great cost savings to our local taxpayers.

Third, the local levee district elected officials need to be given back their original responsibility of overseeing levee maintenance only. They are, for the most part, unpaid people that thought when they took the job for the local districts their only responsibility was going to be to maintaining levees, and that is a very good responsibility for them because they see the levees on a day-to-day basis. Now they are told they are the owners, they are responsible, and they have some liability problems, and they are saying, wait a minute. We are not getting paid for doing this and we are risking personal liability problems? That is a real dilemma.

And last, the Corps of Engineers should do a risk assessment on all Corps-sponsored levees around the Nation and FEMA should exempt levee systems designed to withstand a 100-year or more flood that the Corps deemed to be of low risk.

Everybody is being treated as one here, one shoe fits all, and has been said by Mr. Rash, that is the problem that we are facing, is that is not the case in many areas. Some areas have levees that do have a lot of problems, but our area and apparently Mr. Rash's area are living under levees that have been well maintained and should be put in a different category to make the certification process much easier.

Senator TESTER. Thank you. Before I head out, and I appreciate those recommendations, I want to thank everybody on this panel. I usually ask everybody a question or two, but the fact is, I think, that the explanations you gave from your perspectives add a lot to this hearing and they are critically important.

I would like to think this issue will be resolved after we come back from the August recess, but I have a notion it won't be, and so I appreciate you folks presenting your opinion and being open

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to talk about the situation from your perspective. So thank you all for being here.

Senator PRYOR. Thank you, Senator Tester.

I have a few follow-up questions. You all don't worry about those buzzes there. That is just telling us what is going on the floor.

Let me start, if I may—I will go ahead and start with you, Ms. Medlock, because I have a question about this sheet here[1] and I just don't understand the policy, the rates, how they are set, etc. But, for example, you have seen in this map here in Marion, Arkansas, you see that we are in the Zone X, the shaded area there, what we call Shaded Zone X. And if I understand this right, if you are in—say you have a $100,000 home and you are in Zone A, which is within the 100-year floodplain, if you are in Zone A, it is going to be $794 a year. But if you are in Zone X, it is going to be $593 per year. So that is still about 70 percent of the higher-risk flood area. Do you know how these rates are set?

Ms. MEDLOCK. Well, first, I would draw on the expertise of FEMA folks and folks within the Flood Insurance Administration to give detailed response. But generally, based on my expertise and experience on this, and also as Dr. Knight explained earlier that it is based on the characteristics that are there and you have basic rates that are set, and then the policies are rated farther based on things that are unique to that structure, for example, its proximity to the flooding source and, importantly, its depth.

If I understand your question, it sounds like—and I might ask you to clarify it, but it sounds like you are asking, if you are outside of an identified Special Flood Hazard Area——

Senator PRYOR. Right.

Ms. MEDLOCK [continuing]. Then what is that risk based on.

Senator PRYOR. Right.

Ms. MEDLOCK. OK. I sensed that, and basically what it comes down to is the fact that there is still residual risk. And even if you are outside a Special Flood Hazard Area, particularly if you are in an area subject to inundation when a levee fails, you have still got a risk back there, and the policies and the rates and the premiums are going to reflect that risk.

Senator PRYOR. I understand that. I think what troubles me about this is there is not a very big change. Again, it is about a 70 percent difference, or it is a difference of $593 versus $794, and I haven't done the math, but that seems to be about 70 percent or so to me. That if you are in, say, a 500-year flood area versus a 100-year flood area, it would seem to me there would be a really big drop-off in your premium because the risk would be so much less. Is that not how it works?

Ms. MEDLOCK. It will vary a little bit. And again, I am answering based on my expertise as a Certified Floodplain Manager (CFM) for 9 or 10 years. But the difference between the so-called 100-year and the so-called 500-year really may not actually be that different because the ratings are not just about probability. The ratings are also about the value of the property that is at risk. And for a more detailed response than that, I would really need to rely on the ex-

[1] Chart referenced by Senator Pryor appears in the appendix on page 46.

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perts within the Flood Insurance Administration or do some more digging.

Senator PRYOR. Right. I mean, I understand that, but you can just see, given these maps, see the really dark gray areas? Those would be the Zone A areas. And then the lighter gray, the shaded areas would be the Zone X areas. And you can see they are right next to each other. In terms of the property values, they really shouldn't be all that significantly different, maybe a little bit here and there, but not that significant. It is one community. But nonetheless, we can follow up on that more for our previous panel in written questions.

Let me ask you, Dr. Suhayda, as I understand your testimony before, you were saying that someone that you are aware of went through the appeal process. Was that someone locally down there?

Mr. SUHAYDA. There have been about five different communities that did submit a formal appeal and are in the process of being resolved.

Senator PRYOR. How does that appeal process work?

Mr. SUHAYDA. There was usually a pre-release of the digital Flood Insurance Maps, well before the 90-day official period started so that the communities had some forewarning of what the maps might look like.

Senator PRYOR. Were those posted on the Internet or were they sent to the courthouse or how did people get hold of those?

Mr. SUHAYDA. Those, as I participated in, were actually delivered at a meeting that FEMA called to give a preview. Then there was the official time when those maps were released to the community that triggered the 90-day appeal period. But we had already seen the maps before that, in most cases.

Senator PRYOR. OK. And then if you wanted to appeal, if you didn't agree with what was on the map, how did you actually go through that appeal?

Mr. SUHAYDA. As described by Dr. Knight, we would look for technical and scientific deficiencies. We were able to redo many of the wave calculations, and in some cases storm surge calculations, which are required, and then submit updated BFEs. That is, we redid certain panels——

Senator PRYOR. When you say "we"——

Mr. SUHAYDA. The community, the individual parishes——

Senator PRYOR. And you paid for that?

Mr. SUHAYDA. They spent an aggregate about $1 million. It ran about $250,000 to $300,000 per community to do this.

Senator PRYOR. So the communities paid for that out of their resources, whatever——

Mr. SUHAYDA. That is correct. Just to illustrate a point, the V Zone issue for the State tied up, and I am using rough numbers because they were never real clear, hundreds of millions of dollars of public assistance projects. So there was no doubt that there was going to be a strong motivation on the part of our parishes to at least look into the validity of those V Zone designations.

Senator PRYOR. OK. And then what do you do? Do you write a letter to FEMA? How does the appeal process actually work?

Mr. SUHAYDA. We prepared an appeal report, which is a detailed presentation of criticism, identification of deficiencies, and then

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presentation of new data, and then a replacement set of calculations, and then ultimately the new flood zones and elevations. So we had to recompute the flood zones and elevations within the 90 days.

Senator PRYOR. And that was all at your own expense?

Mr. SUHAYDA. All at the community's expense.

Senator PRYOR. And how much did the maps change after your appeal process?

Mr. SUHAYDA. We are not through all of them. The first response we are getting related to Cameron Parish is that many of the V Zones appear to be remapped in a subsequent set of maps as A Zones, and that was a major issue for Cameron Parish.

Senator PRYOR. And so that is an improvement?

Mr. SUHAYDA. That is an improvement. I think more accurate, but it also addresses the expenditure of this public assistance money not only for the current situation, but the next time we have a problem in Cameron Parish. The V Zone issue now, I think, has been properly addressed.

Senator PRYOR. Was there ever a third party? I mean, I know you had to hire a third party, but was there a third party that participated in this appeal in terms of someone who reviewed FEMA's work versus your work, or did FEMA just evaluate the work that you turned in to them?

Mr. SUHAYDA. They evaluate it, but, of course, they have a number of contractors. They have a separate contractor, separate from the contractor that developed the maps, they have a separate contractor that handles appeals. And so we dealt with the contractor that deals with appeals directly.

Senator PRYOR. And did you feel that you were being treated fairly during the appeal process? I know they are not all over yet, but so far, have you felt like you have been dealt with fairly?

Mr. SUHAYDA. I would say it started off kind of slow, but did improve and that we are at a point now where I think our involvement is much more effective than the first, actually within the 90 days.

Senator PRYOR. And how long has the appeal been going on? The appeals, how long have they been going on?

Mr. SUHAYDA. Oh, my gosh, some of them—we submitted the—a year or more, in some cases 18 months.

Senator PRYOR. Is there any sort of stay in the meantime in terms of flood insurance and other issues?

Mr. SUHAYDA. Yes. Until we get that letter of final determination, we are in the process of dealing with appeal issues. And then there is, of course, a six-month period of time after that before they have to be enacted, so——

Senator PRYOR. I think you are touching on something that FEMA can't fix right now, or no one else can fix right now except the Congress, and that is that I think that there is something that we need to fix, and that is FEMA pretty much controls this whole process, start to finish. They get the Corps of Engineers to do the technical work on the maps. FEMA makes decisions on the maps. They run the Flood Insurance Program. They set the premiums. They feel like they have a fiduciary duty under the Flood Insurance Program. If there is an appeal, it goes to FEMA, and if it is not

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FEMA itself, there is a FEMA contracted entity, whoever that may be.

I just think that FEMA controls this process from start to finish and I am not sure that is healthy, especially considering the fact that FEMA has, quite frankly, an incentive to sell insurance, sell flood insurance. But that is not really the subject of this hearing because that might actually fall under the Banking Committee in terms of reworking the National Flood Insurance Program, which I think we probably need to do much sooner rather than later.

Let me ask you, Mr. Mehlhoff—again, thank you for coming from Montana—have you had any dealings with FEMA during this process?

Mr. MEHLHOFF. Yes, Senator, I have, and I would just like to say that your last comments, I totally agree with. I think that is something that needs to be done.

FEMA has come to Great Falls two different times to meet with us. We have been told different things each time they are in. We seem to have a moving target on acceptable data. At their first meeting, they seemed to say that the data you originally had when the levee was certified should work for certification. The next time, they started backtracking on what they said. Now, we are not exactly sure where we stand.

We haven't had a flood since these levees were built in 1978, when they were finished—or 1987, I am sorry. Our last flood was in 1975. So the data that was originally given to us should be workable, but nobody seems to be able to make that decision to say, yes, go ahead. We can accept what you have, or you need this, this, and this, and then we are ready to go.

Senator PRYOR. I think we have had that experience in Arkansas, too. I have heard from Mr. Rash and many others who have been in the process that it has been very hard to get clear guidance and clear communication from FEMA on how all this is going to work, and there are a lot of particulars that seem to change.

Did you want to add to that, Mr. Rash, before I move on?

Mr. RASH. Yes, sir. We have worked with FEMA, as well, on the certification process. We currently have sections of levee on the tributary that are awaiting analysis on the Corps' recommendation for that certification and how it is going to be interpreted by FEMA.

I would like to say something else. Dr. Knight has been very helpful and worked with us recently on some of these issues, so I do want to say that and that we did meet with them Monday. We went through a number of issues that we have addressed here today and they are looking at them. But we have worked with them much better recently and they have been much, much more receptive to our concerns.

I also would like to say that I left out earlier, not one acre of area protected by MR&T levees has ever had—has flooded since 1928, since the Federal Government took over the construction of them.

Senator PRYOR. OK. Let me ask, Mr. Rash, while I have you, one last question for you, and that is tell us—you have how many miles of levee in your system?

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Mr. RASH. Two-hundred-and-thirty-five in the St. Francis—in our district.

Senator PRYOR. OK. And your district also connects with other districts, is that right?

Mr. RASH. That is correct, sir.

Senator PRYOR. And what would happen if, say, hypothetically, there is a district that is not in yours, but in an adjacent district that may have a problem, even if it is a minor problem, and they can't get their levee, whether it be certified or whatever the technical term may be. What impact would that have on you?

Mr. RASH. Well, we are waiting on that very determination now in that scenario, Senator. We have an area north of us in Dunklin County, Missouri, that has been found under these new guidelines to be inferior and have issues and problems. The Corps—originally, we started off where the entire area was going to be decertified, everything downstream. Since then, the Corps has done some analysis to show the actual effects if there were a levee breach. They have done a breach analysis on that particular section of levee. We are waiting for FEMA to decide what the ultimate effects on the other hydrologically connected sections are going to be.

The best case scenario is that the area of confinement where the breach analysis shows to be affected would receive the higher rate or the higher Special Flood Hazard Area designation. The remainder would get an acceptable rating and be certified.

The worst case scenario is that the entire 111 miles of levee would be decertified and everything that would be protected by that would be in the highest rate of insurance or the highest flood risk. And it could fall anywhere in between and it is based on how FEMA takes the Corps—how FEMA interprets the Corps recommendation.

Senator PRYOR. OK. And do you know when you will find out how that is going to be resolved?

Mr. RASH. I do not, Senator. When we talked Monday with FEMA, they did say that they were under—they had just received the report. In all fairness, they just received the report and so they are looking at all of the aspects of it and told us that they would get back to us on their determination.

Senator PRYOR. OK. Dr. Maidment, let me ask you, this is from my standpoint a technical question. For you, it may be just a lay question. But there is a term called Base Flood Elevation.

Mr. MAIDMENT. Mm-hmm.

Senator PRYOR. And if I am not mistaken, in Arkansas, we don't have a Base Flood Elevation. It is not determined. Is that right?

Mr. MAIDMENT. Well, the determination of whether a map has a Base Flood Elevation or not is made——

Senator PRYOR. And can you tell us the significance of that as you are explaining what it means?

Mr. MAIDMENT. OK. So Base Flood Elevation is that elevation that the water will achieve when a 1 percent annual flood happens. So if the 100-year flood happens, it refers to the water service elevation above a geodetic data. I mean, that is what the term Base Flood Evaluation means.

The significance of that is the term that is used by local entities for regulating floodplain development. So the houses have to have

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their base—their first floor elevation above the Base Flood Elevation, sometimes just immediate or sometimes a foot above the Base Flood Elevation.

Senator PRYOR. OK. Well, we have—I guess on this map, I am looking at Zone A. It says, no Base Flood Elevation determined, but then Zone AE, it said Base Flood Elevation is determined.

Mr. MAIDMENT. That is right. So AE means you have Base Flood Elevations and A means you don't.

Senator PRYOR. OK. Based on that Base Flood Elevation designation, do other things happen as a result of that, or is that just pretty much local building codes and zoning, things like that?

Mr. MAIDMENT. Yes, it is basically to support local building codes and zoning.

Senator PRYOR. OK. Well, you all have been great. Oh, I did have one more question for you, Dr. Maidment, and that is you talked about the U.S. Geological Survey——

Mr. MAIDMENT. Mm-hmm.

Senator PRYOR. And apparently they had done a lot of maps in the past and they have a pretty old average age at this point.

Mr. MAIDMENT. Mm-hmm.

Senator PRYOR. Is there a reason why they didn't do these maps here for this round? Do you know why the Corps of Engineers did that and not U.S. Geological Survey?

Mr. MAIDMENT. No, sir, I don't.

Senator PRYOR. OK. Do you know who is better at making maps, or are both good at their own map making? I mean——

Mr. MAIDMENT. Well, I would say the two agencies have different responsibilities. The fundamental contribution of the U.S. Geological Survey is the base map input information. So, in other words, in a flood map you have three things. It is where are things horizontally, where are they vertically, and the USGS supplies basic information that defines that. Then you put the water layer on top, and that is where the Corps of Engineers and FEMA come in. It is that hydrology expertise that supplies the third piece of the puzzle.

Senator PRYOR. OK. Well, that is helpful.

I want to thank all of you for your testimony today. What we are going to do is we are going to leave the record open here for 15 days, and I can almost guarantee you each of you will get questions, as well as the earlier panel will get follow-up questions from the Committee, either folks who are here today or who couldn't be here today, and we would love to get those responses from you as quickly as possible.

I just want to thank you all for your attendance and your preparation and the time. This is an important issue. It is not just a local issue, it is a national issue, and we appreciate all your contributions to it.

So with that, I will adjourn the meeting and thank you for your help.

[Whereupon, at 5:09 p.m., the Subcommittees were adjourned.]

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APPENDIX

STATEMENT OF CHAIRMAN LANDRIEU

Flood Preparedness & Mitigation: Map Modernization, Levee Inspections, & Levee Repairs

Joint Hearing of the Subcommittee on Disaster Recovery & the Subcommittee on State, Local, and Private Sector Preparedness and Integration

July 28, 2010

Introduction

Good morning, and thank you all for attending this afternoon's hearing on flood preparedness and mitigation. I am pleased to be joined by my Ranking Member, as well as the Chair and Ranking Member of our sister subcommittee, with whom we work so closely on disaster management issues. I would like to begin by outlining some of the questions we will address in today's hearing, and then offer a few remarks on flood insurance, flood maps, and flood protection.

Questions this Hearing will address

Over the course of today's proceedings, we will seek to address the following questions:

1) Are FEMA's flood maps technically accurate, and if not, how can they be improved?
2) How will FEMA's new process for resolving map disputes with local communities work?
3) Should the Corps of Engineers offer to inspect locally-owned levees, and how else can local governments finance these costly engineering inspections?
4) Should the Corps of Engineers share in the cost to repair locally-owned levees, and how else can localities finance repairs?
5) What can be done to improve outreach to property owners earlier in the mapping process?

Landrieu Letter & FEMA's Response

On March 18th, Senator Pryor and I sent a letter with 14 other Senators to FEMA and the Corps of Engineers outlining our concerns about flood mapping methods and community outreach, insurance affordability, and challenges repairing flood control structures. In response to this letter, FEMA has taken meaningful action to address affordability and map disputes.

The NFIP will begin offering low-cost Preferred Risk Policies for a two-year period beginning January 1st to qualified homeowners who live in areas recently re-designated as flood zones. FEMA will also establish independent Scientific Resolution Panels to settle flood map disputes between the agency and local communities. These panels will become operational November 1st and will likely be comprised of experts from the National Institute of Building Sciences.

I will submit a copy of the letter we sent for the hearing record, along with FEMA's response and a document that provides additional details on the Scientific Resolution Panel. I appreciate the administration's action-oriented response, and look forward to learning more about these new options during the course of today's hearing.

National Flood Insurance Program (NFIP)

Flood insurance was not widely available or affordable on the private market before 1968, when the federal government created a program to protect homeowners from the nation's single greatest hazard. The

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program was designed to help people not penalize them. Those who choose not to purchase insurance risk losing everything they own and being left without resources to rebuild their homes. Without flood insurance, the most they can receive from FEMA for repairs is about $30,000, and many of them would be forced to take out loans instead.

But the program was also intended to make people who live in vulnerable areas share the financial risk for repairing damaged property after a disaster. Things haven't worked out exactly as intended. As of April, the program owed $18.8 billion in debt because it's not actuarially sound. Only around 50% of the people who are at risk of flooding pay into the program, and many of them pay premiums that are heavily subsidized and do not reflect their actual risk.

So we understand that FEMA must get its financial house in order with regard to this program, and while added expenses are never welcomed by homeowners during difficult economic times, this program was intended to be self-sustaining, not taxpayer-funded. Political reluctance to charge actuarially sound rates or withhold assistance from property owners that fail to elevate, relocate, or purchase insurance, has plunged the program so deep into debt, that Americans currently pay tens of millions each year just to cover the accrued interest.

Flood Maps

Congress authorized the FEMA Map Modernization Program in 2003 to update maps that were 20 or 30 years old in most cases, put them in a digital format that can be shared with local planners, emergency managers, and homeowners, and provide the National Flood Insurance Program with better risk information to set its rates. Since Map Modernization began, FEMA has re-mapped 13,000 communities encompassing 80% of the nation's population.

The need for solid elevation data is an important part of this process. National Elevation Dataset maintained by the U.S. Geological Survey dates back to 1970, and as we will hear from Dr. Maidment and Dr. Suhayda, sonar data called LIDAR is critical to refining risk maps so we can distinguish not just between structures being inside or outside the floodplain, but also account for the differences within the floodplain, based on features of the terrain and the height of the structures. Without elevation data, FEMA cannot issue Base Flood Elevations (BFEs), and communities cannot make informed decisions about land use, new construction, or mitigation projects.

Levee Failures

The United States has approximately 100,000 miles of levees in 22% of its counties protecting 43% of the population. We have witnessed major levee failures in recent years that cost thousands of lives and billions of dollars in damage, including New Orleans in 2005, the Midwest in 2008, North Dakota and Georgia in 2009, and earlier this year in Rhode Island and Tennessee. So we have come to realize that levees are not infallible, and we must create a workable system that provides for their proper design, maintenance, and upkeep. Levees erode and decay over time, and we cannot ascribe protective qualities to them without monitoring and certifying their integrity. But as Representative Melhoff will describe, local governments are struggling to pay for levee inspections and repairs, so we must consider whether an expanded federal role may be appropriate, in providing technical assistance and financial resources for these activities.

While this hearing is focused specifically on levees as a method of flood control, we must also re-focus the nation's attention on *non-structural* measures of protecting people, which may also produce new economic and environmental benefits. These include integrated water management, urban water retention,

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utilization of the natural floodplain, and coastal restoration. Now more than ever, the staggering nationwide cost of levee maintenance and repairs, combined with the impacts of climate change and rising sea levels, dictate the need for this country to re-examine the way we live with water.

Conclusion

I am not interested in expanding the Flood Insurance Program's multi-billion dollar deficit by continuing to delay maps, freeze premiums, and put off hard choices. Nor should we obfuscate risk by declaring local levees safe when engineers doubt their capacity to perform during a flood.

But FEMA and the Corps of Engineers need to lean forward as much as possible to improve map accuracy, build capacity among the states to do their own mapping and floodplain management, and provide additional resources and technical support for local levee inspections and repairs. States and localities must take emergency preparedness seriously enough to invest in levee maintenance and build political consensus around it. And property owners need to fully understand the flood risks that exist in the places where they live, and the costs and tradeoffs required to effectively mitigate them.

I am confident that we can build a holistic and sustainable approach toward flood preparedness and risk mitigation in this country, and I look forward to hearing suggestions from the witnesses who are with us today about how we can get there.

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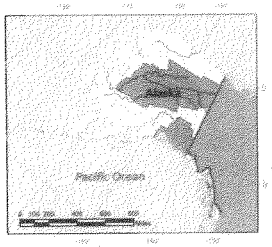
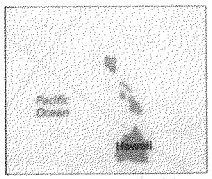
United States Counties where levees are found.

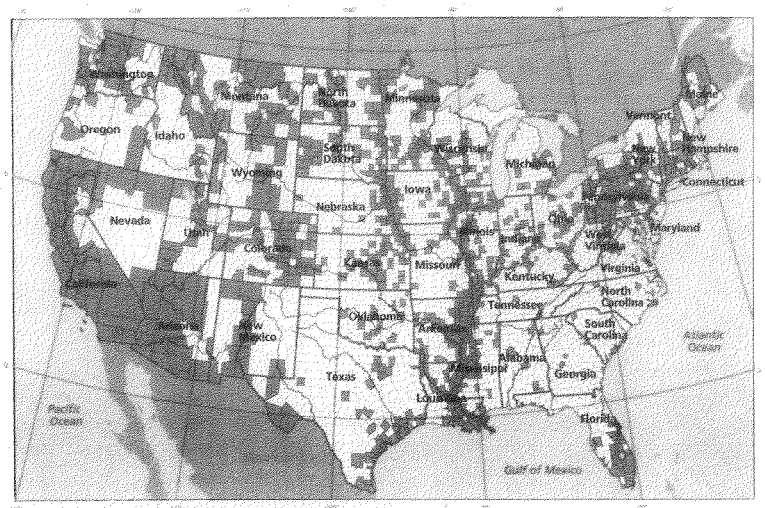
April 1, 1997 --- The flag still flies over this flooded East Grand Forks, Minnesota neighborhood.
David Saville/FEMA News



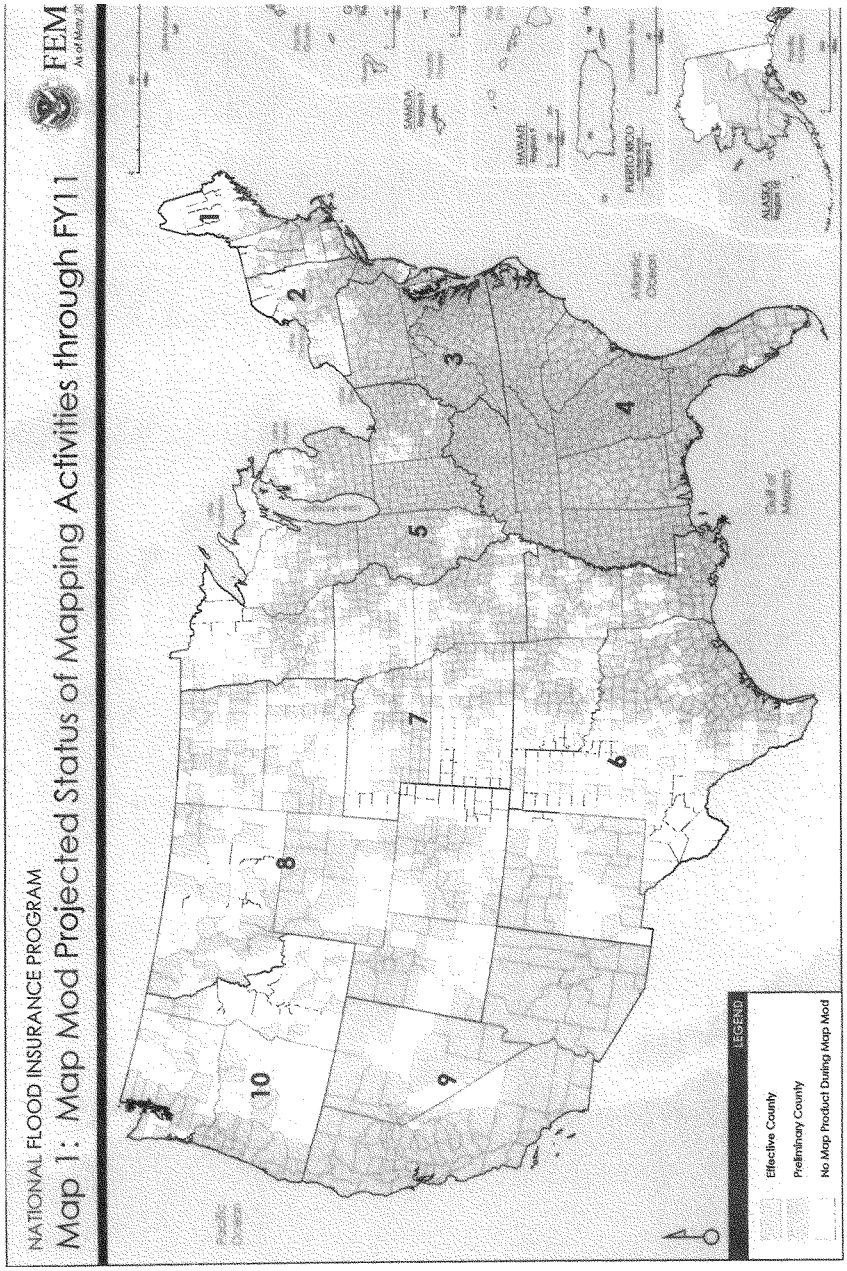


Legend
Lakes
Counties with levees
Rivers
State Boundaries

Albers Projection
Central Meridian: -96
1st Std Parallel: 20
2nd Std Parallel: 60
Latitude of Origin: 40



Note: A national levee inventory project is underway. Information shown on this map is current as of August 2009 but may change in the future.


NATIONAL FLOOD INSURANCE PROGRAM
Map 1: Map Mod Projected Status of Mapping Activities through FY11
FEM
1
2
3
4
5
6
7
8
9
10
LEGEND
Effective County
Preliminary County
No Map Product During Map Mod

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PREFERRED RISK POLICY RATES

*No Basement or Enclosure
*Deductible – Standard
*Rates Effective October 1, 2009

COVERAGE AMOUNT Building / Contents	ANNUAL PREMIUM Zones B, C, X (Pre-/Post-FIRM)	ANNUAL PREMIUM A Zones (Pre-FIRM)	ANNUAL PREMIUM V Zones (Pre-FIRM)
$50,000 / $10,000	$431 / $155	$490 / $132	$605 / $158
$100,000 / $30,000	$593 / $354	$794 / $327	$1,296 / $470
$150,000 / $50,000	$698 / $428	$1,079 / $533	$2,036 / $978
$250,000 / $100,000	$906 / $613	$1,634 / $1,048	$3,501 / $2,248

■ Association of State Floodplain Managers

58405.007

DEPARTMENT OF THE ARMY

COMPLETE STATEMENT

THE HONORABLE JO-ELLEN DARCY
ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS)

BEFORE

AD HOC SUBCOMMITTEE ON DISASTER RECOVERY
AND
AD HOC SUBCOMMITTEE ON STATE, LOCAL AND PRIVATE SECTOR PREPAREDNESS AND INTEGRATION

COMMITTEE ON HOMELAND SECURITY AND GOVERNMENT AFFAIRS

UNITED STATES SENATE

ON
FLOOD PREPAREDNESS AND MITIGATION: MAP MODERNIZATION, LEVEE INSPECTIONS AND LEVEE REPAIRS

JULY 28, 2010

Chairs Landrieu and Pryor and distinguished members of the Subcommittees, thank you for the opportunity to testify before you today and present information on the roles and responsibilities of the U.S. Army Corps of Engineers (Corps) in community flood preparedness and mitigation efforts, specifically related to the national flood plain remapping efforts and levees.

Before I discuss the details of the Corps efforts, I believe it would be of value to give an overview of our broad roles and responsibilities.

The Corps Roles and Responsibilities in Flood Risk Management

The Corps shares with the Federal Emergency Management Agency (FEMA), both the expertise and mandate under its respective authorities and missions to address the nation's vulnerabilities to flood related disasters and damages. Since passage of the Flood Control Act of 1936 established a federal role in flood management, the Corps authorized responsibilities have expanded to include developing structural and nonstructural solutions to managing flood risks, inspecting the condition of existing flood management infrastructure, providing technical and planning support to states and communities, conducting advance emergency measures to alleviate impending flooding, providing emergency floodfight support, and rehabilitating levees and other flood management infrastructure damaged by flooding.

In recent years, the Corps has placed an increasing emphasis on nonstructural approaches to flood risk management. Nonstructural alternatives focus on efforts and measures to reduce flood damages in an area by addressing the development in the flood plain, such as: flood plain zoning, participating in the National Flood Insurance Program (NFIP), developing and implementing flood warning systems (coordinated with the National Oceanic and Atmospheric Administration's (NOAA's) flood warning program) and emergency evacuation plans, and flood proofing individual structures as well as removing structures from the extreme flood hazard areas. Other measures, such as setback levees, are also being encouraged by the Corps, as they offer greater natural use of the floodplain while still providing structural protection from floodwaters if completely non-structural alternatives are not viable.

The Corps can provide flood risk management technical or emergency assistance through a wide variety of authorities and programs. For example, through its Flood Plain Management Services Program (FPMS), the Corps can provide information, technical assistance and planning guidance (paid for by the federal government) to states and local communities to help them address flood risk management issues. Typical focus areas are flood hazard evaluation, dam break analysis, flood warning preparedness, flood plain management and much more. In cases where flooding is imminent in a specific area, the Corps is authorized to take immediate advance measures to protect life and property, such as constructing temporary flow restriction structures and removing log debris blockages.

The responsibility for managing the nation's flood risks does not lie exclusively with federal agencies, such as the Corps and FEMA. Rather, it is shared across multiple federal, state, and local government agencies with a complex set of programs and authorities, including private citizens and private enterprises such as banking and insurance industries, as well as developers.

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Traditionally, Corps efforts to address flooding hazards have been through Civil Works projects to reduce the probability of flooding through the construction of levees or other flood management infrastructure. Today, the Corps is focusing on the most effective combination of tools available that citizens may use to lower or "buy down" their flood risk. The Corps will consider not only reducing the probability of flooding, but also reducing the consequences should a flood occur. Furthermore, the decision on which tools to implement involves all stakeholders. For example, the Corps can help reduce risk by building levees, whereas in a coordinated but independent action, local government can further reduce flood risk by implementing flood plain management actions such as evacuation plans, zoning ordinances and public outreach.

This cannot be achieved without a new paradigm of joint partnerships in a comprehensive approach of public education and flood risk management. For this reason, in May 2006, the Corps implemented the National Flood Risk Management Program (NFRMP). Its purpose is to integrate and synchronize the ongoing, diverse flood risk management projects, programs and authorities of the Corps with counterpart projects, programs and authorities of FEMA, other federal agencies, state organizations, and regional and local agencies.

The Corps Roles and Responsibilities in Emergency Management and Preparedness

Public Law 84-99 (1955), as amended (33 USC 701n) established the Flood Control and Coastal Emergencies (FCCE) program. It includes responsibility for disaster preparedness, emergency operations, rehabilitation of flood damage reduction projects, provision of emergency water, advance measures when the threat of flooding is imminent, and participation in FEMA led hazard mitigation teams.

Disaster preparedness consists of functions required to ensure that the Corps is ready to respond to a broad range of disasters and emergencies. Corps flood preparedness includes coordination, planning, training, and the conducting of response exercises with key local, state, and tribal stakeholders/partners. Establishing and maintaining good working relationships benefits both the Corps and its partner and improves communications during a flood response. Also, confirming points of contact for both state/local partners and the Corps on a periodic basis allows for exchanges of information and updating on key areas of interest. Being aware of state and local authorities, requirements, capabilities and expectations helps the Corps determine how it can best supplement state and local needs. Conversely, educating state and local entities about Corps authorities, requirements and expectations illuminates potential gaps and overlaps. These activities ensure Corps personnel assigned emergency assistance responsibilities are trained and equipped to accomplish their missions.

Emergency operations provides for response to disasters and includes field investigations of potential natural disasters, flood response and rescue operations, protection of federally authorized and completed hurricane and storm damage reduction projects, preparation of after action reports, post flood response, operational supplies and equipment, and operational support. Flood response includes flood fight assistance (Corps flood fight assistance is 100% federally funded with the exception of supplies and equipment), technical assistance, and direct assistance

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such as sandbags, pumps, and emergency contracting. The Corps first concern is always public safety. Each person should be aware of current and future flood events, stay in touch for the latest updates and warnings, particularly changing weather and river conditions as monitored and forecasted by the National Weather Service, have evacuation plans prepared and implemented, and avoid flooded areas and moving water unless involved in the flood fight effort.

The Rehabilitation and Inspection Program (RIP) provides for the inspection and rehabilitation of federal and non-federal flood damage reduction (FDR) projects damaged or destroyed by floods, and the rehabilitation of federally authorized and constructed hurricane and storm damage reduction projects damaged or destroyed by wind, wave or water action of an other-than-ordinary nature. A project is eligible for rehabilitation as long as it is properly operated and maintained as determined by a Corps inspection, which is conducted annually.

The Corps Roles and Responsibilities in the Map Modernization Program

Both the Corps and FEMA have a long history of partnering on flood plain mapping as part of the NFIP. Over the past 30 years, the Corps has completed more than 3,000 studies for FEMA related to identifying the flood potential of various areas across the country. These studies involved activities such as flood plain delineations and detailed flood insurance studies. In August 2005, both agencies signed an agreement that further streamlined the process for the Corps to provide flood plain mapping and other related services to FEMA.

FEMA has embarked on a program, known as the Map Modernization Program (MapMod), to update and improve the nation's Flood Insurance Rate Maps (FIRMs). This nationwide program has provided an excellent opportunity for the two agencies to strengthen their working relationship. As a result, they have been very successful through MapMod in leveraging data, partnering on flood plain studies, collaborating on related policy changes and jointly communicating flood hazard information to the public.

The Corps cooperates with FEMA and other federal, state and local agencies through numerous avenues in support of FEMA's remapping program. These are to:

- Provide data collected from previous or current Corps studies such as hydraulic and hydrologic models and topographic mapping;
- Perform new flood plain mapping studies or provide technical assistance directly to FEMA or through partnerships with state and local governments under the FPMS Program or Planning Assistance to States (PAS) Program;
- Provide available levee information collected through the Corps Levee Safety Program. This includes the development of the National Levee Database and improved levee inspections and assessments;
- Support levee certification when possible; and
- Conduct more detailed flood risk reduction studies through the Corps cost-sharing processes in order to evaluate an array of alternatives to reduce flood risk; thus, influencing how the area would be remapped in the future.

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The Corps and FEMA will continue this partnership as FEMA transitions into their Risk Mapping, Analysis, and Planning (RiskMAP) program.

The Corps Roles and Responsibilities with Levees

The Corps has a long history of planning, designing, constructing, floodfighting, and rehabilitating numerous levee systems throughout the nation. Hurricane Katrina in August 2005 and the Midwest Floods of June 2008 highlight the importance of evaluating and communicating the risks associated with levee systems to the public and decision makers. There are many questions that need to be answered - How many miles of levees exist? Where are they? What is the condition of these levees? What are the consequences of poor performance? Which entity is responsible for these levees? What areas are at the highest risks? How should federal, state, and local resources be prioritized to reduce these risks? What can be done, together, in the interim to reduce these risks? In order to begin answering these questions, levees need to be identified and the risks associated with these levees assessed in a consistent manner across the nation.

In November 2007, the Corps officially established its Levee Safety Program, an important step forward to ensure the public is aware of the risks associated with levees within Corps authorities. The mission of the program is to assess the integrity and viability of levee systems and recommend actions to ensure these systems do not pose unacceptable risks. The main objectives are to hold public safety paramount, reduce adverse economic impacts, and develop reliable and accurate information.

Levees within the Corps Levee Safety Program include those, regardless of design level, which are 1) federally authorized and Corps operated and maintained; 2) Corps constructed and locally operated and maintained; and 3) locally constructed and locally maintained, but have been accepted into the Corps Rehabilitation and Inspection Program (RIP). Levees within the Corps program consist of approximately 14,000 miles or 2,000 levee systems. It should be noted that the total number of miles of all other levees nationwide is currently unknown, but has been estimated to be up to 100,000 miles.

Within the Corps Levee Safety Program, a National Levee Database has been created to serve as a national source of information to facilitate and link activities, including flood risk communication, levee certification, levee inspection, flood plain management, and risk assessments. The database presently includes levees within the Corps program. The Water Resources Development Act (WRDA) of 2007 extended the Corps authority and allows the inclusion of all non-federal levees on a voluntary basis. Also, a methodology for performing technical risk assessments of existing levee infrastructure is under development to serve as a consistent framework to evaluate levees nationally and assist in making risk-informed decisions. Additional activities within this program include the creation of national teams to focus on developing new policies in other areas concerning levee safety, such as inspections of existing levee systems in the Corps program, levee screening, tolerable risk guidelines, and interim risk reduction measures.

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Levee Inspections and Levee Screening

The Corps has improved how it inspects and assesses levees, which improves the ability to better communicate the overall condition and associated risks of levee systems to the local sponsors and the public. Improvements include a single consistent inspection checklist to be used on all levee systems the Corps inspects. Additionally, the Corps developed an automated Levee Inspection System tool as part of the National Levee Database. It is a Geographic Information Systems (GIS) / Global Positioning System (GPS)-based inspection tool that incorporates the levee inspection checklist and links directly with the National Levee Database.

The objectives of Corps levee inspections are to –

- Ensure the levee system will perform as expected.
- Identify deficiencies or areas that need monitoring or immediate repair.
- Continuously assess the integrity of the levee system in order to identify any changes over time.
- Collect information in order to make risk-informed decisions about future actions.
- Determine eligibility for federal rehabilitation funding for the levee in accordance with PL 84-99. For levees with an acceptable or minimally acceptable inspection rating, they are eligible for levee rehabilitation assistance for damages incurred during a flood event.
- Determine if the levee is being properly operated and maintained.
- Determine if the local sponsor is in compliance with the project partnership agreement, if applicable.

The Corps conducts two types of levee inspections. The first one is the routine inspection, also referred to as annual inspection or continuing eligibility inspection. It is performed on an annual basis to ensure the levee system is being properly operated and maintained. The periodic inspection is the next level and conducted by a multidisciplinary team led by a professional engineer. It includes a more detailed, comprehensive and consistent evaluation of the condition of the levee system and is conducted every five years. Components of the periodic inspection include evaluating routine inspection items; verifying proper operation and maintenance; evaluating operational adequacy, structural stability and, safety of the system; and comparing current design and construction criteria with those in place when the levee was built. Starting in Fiscal Year 2009, the Corps began conducting periodic inspections of levees with the allocation of $90 million from the American Recovery and Reinvestment Act of 2009. Because of existing authorities, periodic inspections are limited to those levees the Corps operates and maintains; those levees that the Corps performed the initial design and construction; and those levees that have been incorporated by law into the Corps program as a federally authorized levee system. Local sponsors participate on the inspection teams and all final inspection results are provided to the local sponsor and FEMA.

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Beginning this fiscal year, the Corps is applying a levee screening tool to all levees in its inventory. The tool combines inspection data with a preliminary engineering assessment taking into account consequence data and local knowledge of levee performance. Results will be used to rank levee systems based on relative risk to help inform decision makers about future actions to improve public safety associated with the levees. The Corps is developing policy and procedures required for the implementation of Tolerable Risk Guidelines (TRG) within this program. The TRG build on the TRG policies implemented for the Corps Dam Safety Program. We anticipate having final policy and procedure completed within the timeframe of the comprehensive Levee Safety Engineering Regulation currently under development and to be published in Jan 2012.

The Corps Role with Levee Certification for the NFIP

As the federal agency responsible for administering the NFIP, FEMA identifies flood hazards and risks, and provides appropriate flood hazard and risk information to communities nationwide in the FIRMs. Communities in turn, use this information for land-use planning, flood plain management, and flood insurance rating purposes. A community must submit documentation to FEMA demonstrating the levee meets the requirements outlined in Title 44 of the Code of Federal Regulations, Section 65.10 (44 CFR 65.10), *Mapping Areas Protected by Levee Systems,* for a levee to be recognized on a FIRM. This is commonly referred to as "levee certification." The purpose of levee certification is to determine how FEMA will map the floodplain behind the levee for flood insurance purposes. The 1% annual-chance flood is the minimum requirement of the NFIP and is not a safety standard for levees. The Corps strongly recommends purchasing flood insurance even for levees that meet NFIP criteria.

The Corps Levee Safety Program and FEMA's NFIP implement distinctly different authorities, although both agencies work closely to share information between the programs. Corps policy for levee certification is based on who is responsible to provide the levee certification documentation to FEMA, which is the local sponsor or community. It is also based on prioritization of limited funding to focus on its Levee Safety Program activities. The Corps can conduct certifications when requested by a local entity for
(1) levees that are operated and maintained by the Corps and (2) levees that the Corps is designing or constructing. Many previous Corps certifications were provided to FEMA upon project completion when the project sponsor assumed operation and maintenance responsibilities in accordance with the project partnership agreement. Certification of levees that are operated and maintained by entities other than the Corps is to be provided by the local levee sponsor. The Corps may perform levee certifications using funds provided by non-federal sponsors if the local sponsor can demonstrate the Corps is uniquely equipped to do so and that such services are not reasonably and quickly available through ordinary business channels.

There is no direct correlation between Corps Levee Safety Program activities and levee certification. For example, an "Acceptable" inspection rating by the Corps does not equate to a levee certification and an "Unacceptable" inspection rating by the Corps does not automatically "decertify" a levee. Certification for FEMA purposes only evaluates a levee at the 1% annual-chance flood (or 100-year or base flood), so an assessment will need to be made to determine how an identified deficiency may impact the levee's ability to perform at the 100-year event.

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The Corps performs Levee Safety Program activities, such as inspections, on a regular basis. It is important to communicate any identified deficiencies as soon as possible. If the Corps is on record of certifying the levee for FEMA purposes, then the Corps will evaluate how inspection or assessment results may or may not impact the certification. If the Corps did not certify the levee, then FEMA will decide if the certification needs to be revisited based on the information provided by the Corps.

Many Corps Levee Safety Program activities, such as routine and periodic inspections, may help inform and support the certification process. Corps districts will work with local sponsors to provide them with available levee information and technical data.

In order to clarify the Corps role and process involving levee certifications for the NFIP, the Corps will be issuing updated guidance soon - Engineer Circular (EC) 1110-2-6067, *USACE Process for the National Flood Insurance Program (NFIP) Levee System Evaluation.* The purpose of this EC will be to consolidate, supplement, and clarify existing policy and procedures. It should be noted that the term "levee certification" is not used in the title. Additionally, the term "levee certification" is not used at all in this EC. The reason is over the years, the term "levee certification" has led to the misperception that the community is completely safe from flooding if the levee is "certified" or a "levee certification" guarantees performance of that levee. Some in the private sector have stated that using the term "levee certification" contributes to the liability concerns related to levees.

In recognition of this, the Corps was willing to take the initial step and try to start changing this misperception about "levee certifications" by using the term "NFIP Levee System Evaluation" instead. The process and requirements remain the same, but this term better supports FEMA's actual definition of "certification" defined in 44 CFR 65.2(b), which focuses on certification of analysis and data and is not meant to imply a warranty or guarantee.

Next Steps Involving the Corps

A local sponsor has responsibility for operation, maintenance, repair, replacement, and rehabilitation (OMRR&R) of the levee system for most of the levees in the Corps Levee Safety Program. The Corps will communicate the condition and associated risk of the levee system and recommend actions that may include immediate repair of certain deficiencies and/or interim risk reduction measures. The Corps will assist the local sponsor and other stakeholders to develop the best path forward. Given existing authorities, the Corps may provide technical assistance through the FPMS or PAS programs or the local sponsor may want to initiate a cost-shared study under the Corps General Investigations or Section 216, Review of Completed Projects authority.

From a long-term comprehensive flood risk management approach, the Corps is cooperating with FEMA and other federal agencies through the Silver Jackets Program to create interagency teams at the state level to develop and implement solutions to state natural hazard priorities. The Silver Jackets Program's primary goals are to leverage information and resources, improve public risk communication through a united effort, and create a mechanism to collaboratively solve issues and implement initiatives. These teams have improved communication leveraged resources and programs between federal agencies.

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Title IX National Levee Safety Program

I would like to mention the work accomplished under Title IX of WRDA 2007, the National Levee Safety Program. The National Levee Safety Act of the Water Resources Development Act of 2007 (PL 110-114, Title IX, Section 9003) established the National Committee on Levee Safety and directed it to develop recommendations for a national levee safety program. The committee completed its draft report in January 2009, and put forward 20 recommendations for creating a National Levee Safety Program. In May 2009, the Army provided the final draft report to Congress and also participated in a hearing before the House Transportation and Infrastructure Subcommittee on Water Resources and Environment on the recommendations in the report. Related information can be found at the following website: http://www.iwr.usace.army.mil/ncls/.

Although the Corps chairs the committee, its recommendations do not and were not intended to represent an Administration position.

The specific draft recommendations of the committee for a National Levee Safety Program embrace three main concepts: (1) the need for leadership via a National Levee Safety Commission that provides for state delegated programs, national technical standards, risk communication, and coordinating environmental and safety concerns; (2) the building of strong state levee safety programs in all states; and (3) a foundation of well-aligned federal agency programs. The committee recently reconvened and is working to clarify three areas of the report: costs and benefits of a National Levee Safety Program; governance and strategic implementation; and stakeholder involvement. While the committee conducts these activities, the Corps is also working to implement certain components of Title IX and coordinate agency levee safety activities with the committee for activities that align with the recommendations.

This concludes my testimony and I would be happy to answer any questions you or other members of the Subcommittees may have. Thank you.

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Statement of Dr. Sandra K. Knight
Deputy Administrator, Mitigation at the Federal Insurance and Mitigation Administration

Federal Emergency Management Agency
Department of Homeland Security

Presented Before the

Senate Committee on Homeland Security and Government Affairs
Subcommittee on Disaster Recovery
and
Subcommittee on State, Local, and Private Sector Preparedness and Integration

July 28, 2010

Introduction

Good day, Chairwoman Landrieu, Chairman Pryor, Ranking Member Graham, Ranking Member Ensign and Members of the Subcommittees. My name is Sandra Knight. I am the Deputy Administrator for Mitigation at the Federal Insurance and Mitigation Administration in the Department of Homeland Security's (DHS's) Federal Emergency Management Agency (FEMA). Thank you for this opportunity to discuss flood mapping and FEMA's role in helping communities identify and address their flood risks.

Each year, communities in every region of the country experience severe weather events that lead to flooding, cause damage, hurt the economy and, tragically, sometimes result in the loss of life.

That is why, in the National Flood Insurance Act of 1968, Congress mandated that FEMA identify and map flood risks across the country. By identifying these risks, we are helping communities and individuals make informed decisions on floodplain management and future development plans that will save property and protect lives.

By identifying these risks, we are also able to maintain a fair and accurate insurance rating mechanism for the National Flood Insurance Program (NFIP), a requirement of FEMA as the NFIP administrator.

Like any insurance program, the NFIP comes with a cost. And with the current economy, we understand that any new cost can be a burden for many homeowners. The cost of *inaction* could be far greater, however. It could mean property loss and more importantly, the loss of lives. Without NFIP, a property owner may receive as little as $29,900 in federal assistance to help recover, a sum that is insufficient in most cases.

So, my job here today is to address the concerns and answer the questions that many have raised about FEMA's flood mapping program.

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Question 1: Why is flood mapping important?

Flood mapping is important because reliable information about risk is the first step in preventing and reducing flood losses. New and updated maps not only reflect better data on hydrology and topography, but also show changes in the watershed due to variations in weather patterns, changes in landscape due to physical processes, the impact of construction and development on drainage patterns, and the amount of community vulnerability to floods. It is the responsibility of FEMA, as the administrator of the NFIP, to identify and map flood risks in communities across the country so that it can establish and maintain a fair and accurate insurance rating mechanism for the NFIP.

For the 21,168 communities participating in the NFIP, flood maps fulfill other functions. Access to current flood risk data helps local leaders, community planners, builders and developers make important decisions about where and how new structures and developments should be built. Flood maps help emergency personnel and preparedness officials write mitigation and response plans that account for new and evolving flood challenges, and help home and business owners understand the potential impact that flooding can have on their property and make informed decisions about how to protect themselves. The maps also help individuals and communities take actions that reduce their flood risks, protect lives, and decrease damage to property.

Question 2: Why are we mapping now?

Congress requires that we map. In 2003, Congress began appropriating funds for FEMA to modernize and update the Nation's flood map inventory to reflect current flood risks.

This was and is a critically important mandate. In many communities, maps were out of date. In some cases they were 20 to 30 years old and did not accurately reflect current areas of development and the associated flood risks, which in turn hindered the ability of communities and businesses to make informed floodplain management and future development decisions.

The National Flood Insurance Act of 1968 required the NFIP to set premiums to pay for future expected losses, not past ones. Furthermore, Congress began providing substantial funding for FEMA's flood mapping modernization program in 2003 to address the shortfalls of long out-of-date maps and the limits of obsolete technology. Updated mapping is changing flood zone boundaries to reflect the best available data. As a result, special flood hazard areas have been updated to include many properties that were not previously designated as high risk. Because of this new information, millions of other properties are no longer designated as being in special flood hazard areas because flood risks are lower—in some cases due to mitigation measures, such as elevations or relocations that have been put in place.

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At the close of fiscal year 2009, FEMA had issued modernized flood insurance rate maps in a preliminary format for over 80 percent of the nation's population in approximately 13,000 communities. Three quarters of these plans have now been finalized, covering more than 60 percent of the nation's population in about 7,700 communities. While we have seen an overall increase in the size of the Special Flood Hazard Area by roughly 7 percent nationwide, we have also seen an approximate 1 percent net decrease in the number of housing units located within SFHA.

Congress' substantial investment in updated flood maps is also addressing another crucial mitigation challenge. Flood risks are dynamic—they change over time. Water flow and drainage patterns change dramatically over the years due to surface erosion, development, land uses, and other natural forces. With these changes, the likelihood of flooding also changes. Prior to 2003, flood maps were static paper documents, limited in their detail, and hard to use and maintain. Flood maps must be dynamic, however: they need to be regularly updated and constantly maintained. That is why FEMA is committed to assessing the need to update maps at least once every five years, and updating those maps in which the flood hazard has changed.

Today's maps are digital and provide more detailed, reliable and useful data that can be updated more frequently and more cost-effectively. Using modern technology, digitized maps can be easily shared among homeowners, community decision-makers and other stakeholders – and in fact, Flood Insurance Rate Maps are accessed more than 30 million times every year. FEMA has over 1,000 county-wide mapping projects currently underway in every region of the nation. At the end of the map modernization effort, we will have produced modernized maps for more than 92 percent of the nation's population. As a result of this effort, we have a better picture of what areas are most likely to be impacted by flooding, a better foundation for hazard mitigation planning, and can apply these findings to effective community planning requirements.

Question 3: How do we do flood mapping?

Mapping the nation's flood hazards requires a process that incorporates a number of regimented stages of data collection, map development, and review to make sure that each product reflects the highest quality of information available to local communities and to FEMA.

While we are confident that the science we use to develop community maps is strong and sound, mapping flood risk is a dynamic process that requires regular updates to continue to reflect changes in risk levels. Any map is always a snapshot in time, and most require regular updates.

An exhaustive examination of every individual property in every community would, of course, be cost-prohibitive. FEMA received a $220 million appropriation this year to fund flood map updates. However, we estimated recently that a house-by house study in a state the size of New York would cost $800 million. Even if it was affordable, a house-by-house study would require

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vast amounts of time, which would in turn prevent communities from finalizing and using the maps in a timely fashion.

FEMA does not create maps in a vacuum. Our specialists and engineers work directly with contractors and community officials to generate the preliminary products, which then undergo a meticulous community review. We also work directly with communities to manage specified timeframes for map review, appeals, and revisions. The appeals period is an especially important part of our process. As of the end of fiscal year 2009, FEMA had issued approximately 92,000 map panels and received 275 appeal packages. The vast majority of these appeals are in areas where FEMA is proposing increased flood hazards and many have been or will be resolved through community consultation. While we leverage input from local flood studies and experts, the review and input of property owners also ensures that the maps reflect the best information.

Our process also involves education and outreach to help ensure that community leaders and residents understand the process, what the maps mean, and their utility. Each time we roll out preliminary maps in communities—and right now there are more than 400 preliminary maps being processed—we issue public notifications about the maps, when they will become effective, and where citizens can learn more. Town halls are conducted to better explain what the new maps mean for residents and what they might require in terms of insurance protection.

Question 4: Why are people in floodplains required to purchase flood insurance?

The short answer is that it has been law since the 1973 Flood Disaster Protection Act, which directs that mortgage lenders require people in floodplains who have a federally backed mortgage to secure and maintain flood insurance. The NFIP provides an option for less expensive federally backed flood insurance. But it also relates to the NFIP's statutory responsibility to provide, "a reasonable method of sharing the risk of flood loss ..." Essentially, FEMA's flood maps and the NFIP provide mechanisms to better understand flood risk, and to reduce the costs of flooding events to property owners, renters, and the Federal government.

As new flood maps are adopted in communities across the country, one of the things that many individuals do not clearly understand is why flood insurance is typically required for properties located in a higher risk area, or Special Flood Hazard Area – especially when recent history does not include a flood.

Flooding has been and remains the most costly and prevalent natural risk to our nation, but flood insurance has not always been available or affordable. In fact, prior to the establishment of the NFIP, losses had historically been so consistent and costly that many private insurers would not provide protection—or could only do so through policies that most could not afford. The NFIP was created in 1968 to address this problem. By joining the NFIP and agreeing to adopt and enforce higher building and floodplain standards, residents could have access to less expensive federally backed flood insurance. Many property owners in high-risk areas are required by their lenders to carry flood insurance. The 1973 Flood Disaster Protection Act made it law for

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federally regulated mortgage lenders to require flood insurance protection as a condition of loans on the nation's high-risk properties. The availability of insurance has substantially reduced the costs and increased the speed of recovery for those who are insured, and reduced costs to the federal government through a decreased reliance on Disaster Assistance funding.

We understand residents' concerns about having to take on the additional cost of flood insurance coverage, particularly during challenging economic times. The NFIP provides options for property owners to lower their cost of insurance when they are newly designated in high-risk areas. Property owners can save on their premiums through a provision that allows them to "grandfather" into a higher risk zone while taking advantage of a lower rate. Further, we are implementing a new policy on January 1st for communities adopting new maps that will extend the timeframe for property owners to purchase lower-cost, preferred risk policies. It is important to understand that the cost to carry a flood policy is modest when compared to out-of-pocket costs to repair or rebuild, which can be tens of thousands of dollars for even a few inches of water in a home.

It is also critically important to mention that, even when flood insurance is not required, it is more often than not still needed. This is a lesson we have learned in our many years of managing the program, and one that we consistently convey to citizens through our national outreach campaign, FloodSmart. A quarter of all flood claims that we process each year come from moderate and low-risk areas, and flood policies in these areas are affordable. In just moments, a flood can wipe out the personal and financial security that often takes years to build, so we encourage all property owners to talk to their insurance agents, discuss their risk and options and make sure they are protected.

Question 5: Why do levees need to be accredited?

A levee that is determined to be an effective defense against flooding must accurately depict the flood risk in the area on the flood map in order to be accredited. In other words, before we show the existence of a levee on a map, we need to know that the levee is capable of doing what a levee is supposed to do.

There are thousands of miles of levees in the United States. They are designed and constructed to provide a last line of defense for people and properties against major coastal and river flooding events. Accurately depicting flood hazards near levees on flood maps is critical to ensuring the public is aware of the unique flood risks associated with levees so they are armed with facts that will allow them to reduce their risk.

Levees are designed to provide a specific level of protection, and this must be certified, as outlined in 1986 FEMA regulations. And even for the majority of levees that meet FEMA's standard to provide protection against a one-percent annual chance flood, it is our duty to inform people that there is still a possibility of a larger flood overtopping the levee, or causing the levee

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to fail. Homeowners and communities must be aware of what protection they get—and do not get—from a levee.

FEMA's levee-related responsibilities are spelled out in Title 44 of the Code of Federal Regulations Section 65.10. FEMA establishes risk zone determinations in areas behind levees and reflects those determinations on NFIP flood maps, and establishes mapping standards and accredits levees that have been shown to provide protection against the one-percent annual chance flood. To carry out our responsibilities, we rely on levee owners to provide the information we need to clearly represent the flood risks in areas behind levees.

FEMA, along with other federal government agencies, states, communities and private levee owners all have designated roles in the maintenance and certification of levees. While FEMA establishes the criteria to give a levee credit for providing flood protection on our Flood Insurance Rate Maps, we do not certify levees. The levee owner—whether a local government, Federal agency, or private organization—has responsibility for maintaining the levee and providing documentation to show that it is certified. FEMA also does not design, operate, examine, evaluate or maintain levee systems, nor does the agency determine how a structure or system will perform in a flood event.

Many factors can affect a levee's ability to meet the one-percent standard. Levees are man-made and most are earthen embankments subject to decay and deterioration over time. Regular maintenance and periodic upgrades are needed to ensure they can perform to their design standard and meet accreditation criteria.

We also understand that a levee's condition is not always fully documented, and that communities may need additional time to document a levee's condition than is normally available during the flood mapping process. While FEMA does not have the funding or authority to manage this process on behalf of levee owners, we do have programs in place, such as the Provisionally Accredited Levee designation, to facilitate the certification process for communities whose levees are reasonably expected to meet certification criteria, and provide additional time for communities to gather necessary documentation for certification.

Conclusion

FEMA and the NFIP are working diligently with our federal, state, and local partners to update flood maps nationwide and address the concerns of communities. We will continue working with all of our stakeholders to analyze and identify flood risks, produce useful and informative flood maps, and communicate the true and current flood hazards for Americans where they live, work and play. We have both a legal and moral responsibility to depict that risk accurately and we are committed to meeting those responsibilities.

I look forward to answering any questions you may have.

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MT Rep. Robert Melhoff

District 26

Montana House of Representatives

Wednesday, July 28, 2010

Homeland Security and Government Reform

Ad Hoc Subcommittee on Disaster Recovery

My name is Robert Mehlhoff and I am the State Representative from District 26 in Montana. I represent the West Great Falls flood Control & Drainage District and the Vaughn Small Drainage District. For the sake of time I will quote statistics from the Great Falls Levee only. The Vaughn levee is smaller but has proportionally fewer properties.

The Great Falls levee system is a **7.65 mile project**. It was designed, engineered, and constructed by the Corps of Engineers and was completed in 1987 at a cost of just over 10 million federal dollars and over 2 million local dollars. The levee has been inspected annually by the Army Corps and has passed every annual inspection. The periodic (5 year) inspection was just completed but we have received no results yet. We anticipate no serious problems.

Now the flood district has been told that in addition to the Army Corps inspections, there will be a new and costly requirement from FEMA for levee accreditation for the National Flood Insurance Program. At about the same time Great Falls learned that FEMA will require accreditation of the levees, we also learned that the Army Corps no longer performs these accreditations. Without the Corps, the community alone will have to bear the cost of a private engineering firm to conduct this expensive study.

Since the levees were built the Corps of Engineers has accepted responsibility to ensure levee safety. In fact, other levees in Montana have been certified by the Seattle district of the Army Corps relatively recently. But the Corps and FEMA cooperation that had worked for decades, no longer exists, and the losers are levee districts that will be forced to pay for these additional requirements.

The levee districts in Great Falls and Vaughn are in small, sparsely populated, and low income areas. Altogether, there are approximately a thousand properties behind the nearly eight miles of levees. Great Falls and Vaughn simply do not have the population or the tax base to pay for these increased FEMA requirements without the help of the Corps. As if that were not enough, we are also told we may have to redo these expensive studies every 5-10 years to update the certification.

FEMA has asked Great Falls, the Flood District, and Cascade County to enter into a Provisionally Accredited Levee Agreement (PAL) agreement with FEMA. The PAL would obligate the community to accept full responsibility for levee certification and the costs that come with it, and would set a deadline of two years for the completion of a certification study. If we do not sign the PAL agreement our levee will be de-accredited as soon as FEMA's new maps go into effect, and flood insurance will become prohibitively expensive for my low to moderate income constituents. We cannot afford the cost to pay a

private engineer to certify the levee and we cannot afford the flood insurance if we do not complete the certification process. This dilemma is having a devastating effect on our area.

I appreciate the fact that FEMA and the Army Corps have at least come to Great Falls to do some community outreach, and we are grateful to Senator Tester for his work to help bring representatives from these agencies to hear first-hand from the community. But the indisputable fact remains – for Great Falls and many other small cities and towns in this country, we do not have the resources to fund on our own the levee accreditation required by FEMA. And it should not take the personal intervention of a U.S. Senator for FEMA and the Army Corps to work together and to hear from the folks who will be most impacted by their decisions. Because of the economy, folks in my district are having a difficult time making ends meet. Many families could lose their homes if large unanticipated costs are added to their monthly expenses. People who want to sell their home are finding fewer prospective buyers willing to take a chance to purchase a home in the affected area. We had over 800 people show up, many in a Montana blizzard with a chill factor well below zero, to sign a request to our congressional delegation to find a solution. That is the degree of concern that is out there.

What is the solution to this problem?

1. The Corp. of Engineers again needs to take over responsibility for levee certification. The Corps has data all the way back to the construction of our two levees in Cascade County plus data from annual (every year) and periodic (every five year) inspections.
2. When annual and Periodic inspections are completed, the Army Corps should require their contractors to collect enough data to meet FEMA's certification requirements. That would result in a great cost savings to the tax payer.
3. The local levee district elected officials need to be given back their original responsibility of overseeing levee maintenance only.
4. The Corps of Engineers should do a risk assessment on all Corps sponsored levees and FEMA should exempt levee systems designed to withstand a 100-year (or more) flood that the Corps deems to be of low risk.

We have had many meetings and conference calls with the Army Corps and FEMA. We feel that the buck keeps getting passed back and forth and we are not getting definitive answers on what Corps data could be used for certification purposes. The decision on what data can be used is essential to determining what the FEMA certification will cost. We need the Army Corps and FEMA to sit down, go through our data and determine if there is sufficient data for the two agencies to certify our levees. The Army Corps of Engineers needs to represent our interests in this process. After all, the Army Corps engineered, oversaw the construction, and determined required maintenance of these levees.

We live in an area that has seen minimal development since the levees were built. Our levees have never had a flood since construction. We understand there is always a risk with a levee system, but the Corps has stated from the time of construction through the present that our levees built to withstand a 500 year flood, will be effective. Essentially, our levees exist today as they did the day they were built. We cannot understand why the Army Corps of Engineers will not – or is not allowed to -- stand by their work

I would be happy to take questions and would also be happy to send you any written information you would like.

"Flood Preparedness and Mitigation: Map Modernization, Levee Inspection, and Levee Repairs"

Statement of

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and

Chair, Committee on Floodplain Mapping Technologies
and Chair, Committee on FEMA Flood Maps
National Research Council
The National Academies

before the

Ad Hoc Subcommittee on Disaster Recovery and
Ad Hoc Subcommittee on State, Local, and Private Sector Preparedness and Integration
Committee on Homeland Security and Governmental Affairs
U.S. Senate

July 28, 2010

Good afternoon Chairwoman Landrieu, Chairman Pryor, and members of the Subcommittees.

My name is David Maidment and I am the Director of the Center for Research in Water Resources and the Hussein M. Alharthy Centennial Chair in Civil Engineering at The University of Texas at Austin. I understand that the purpose of this hearing is to evaluate preparedness and mitigation efforts among flood-prone communities and responsible federal agencies, by evaluating the accuracy of the FEMA flood map modernization process, mechanisms for dispute resolution, and the impact of levee inspections and certifications on determinations of flood risk. My testimony addresses the first of these questions, the accuracy of the FEMA map modernization process. Thank you for the opportunity to testify today.

I initiated the National Research Council's involvement in reviewing FEMA flood map modernization through its Mapping Sciences Committee, and I served as Chairman of the National Research Council's Committees on Floodplain Mapping Technologies (NRC, 2007)

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and FEMA Flood Maps (NRC, 2009). The National Research Council is the operating arm of the National Academy of Sciences, National Academy of Engineering, and the Institute of Medicine of the National Academies, chartered by Congress in 1863 to advise the government on matters of science and technology.

FEMA has undertaken an ambitious program to provide the nation with coverage of Digital Flood Insurance Rate Maps (DFIRMs). The first phase of this program, called Flood Map Modernization, operated from 2003 to 2008, and a subsequent phase, called Risk Mapping Assessment and Planning (Risk MAP) is now in operation (FEMA, 2009). The Committees that I chaired assessed flood mapping practices during the Flood Map Modernization period. The main focus of our reports was on riverine rather than coastal flood mapping, and today I will confine my comments to the physical aspects of riverine flood mapping.

Committee on Floodplain Mapping Technologies – Elevation for the Nation (NRC, 2007)

During the annual appropriations hearings for Flood Map Modernization, concerns were expressed to Congress that the underlying framework data used as input to the flood mapping process were not of adequate quality in much of the nation to properly support the new digital flood map creation. The National Academies established a Committee on Floodplain Mapping Technologies to examine this issue (NRC, 2007). The underlying framework data consist of two components: firstly, land surface reference information that describes streams, roads, buildings and administrative boundaries that show the background for mapping the flood hazard zone, and secondly, land surface elevation which defines the topography or shape of the land surface. The Committee concluded that the nation's base mapping for land surface reference information is derived from regularly updated earth imagery, and is adequate to support floodplain mapping.

The insurance industry uses floodplain maps to determine if purchasers of new buildings need to have federal flood insurance. This determination is made on the basis of a horizontal criterion: does the building lie within or outside the floodplain? The current DFIRMS adequately support this flood insurance process. If a property owner whose building is classified as being within the floodplain wishes to protest that determination, a laborious and expensive procedure is undertaken, for both the owner and the government, to process a Letter of Map Amendment (LOMA).

An important component of flood maps is the base flood elevation, which is the water surface elevation that would result from a flood having a 1% chance of being equaled or exceeded in any year at the mapped location. Local communities regulating land development typically require the first floor elevation of buildings to be at or above the BFE. This criterion, based on vertical rather than horizontal criteria, is better than that used in flood insurance determinations. Base flood elevations are only shown on floodplain maps that have been prepared with high quality land surface elevation information and detailed or limited detailed flood modeling studies.

As of June 2005, approximately 1 million stream miles had been mapped under Flood Map Modernization, and of this total, one-quarter (247,000 miles) show the base flood elevation as well as the spatial extent of the floodplain, while three-quarters (or 745,000 stream miles) show

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only the spatial extent of the floodplain but not the base flood elevation. The Committee concluded that in order to adequately support the National Flood Insurance Program, updated floodplain maps should show the base flood elevation as well as the spatial extent of the floodplain boundary.

FEMA Map Modernization requires elevation data for floodplain mapping to represent the current conditions in the area, or to be supplemented with updated information. The current National Elevation Dataset is derived from contour information in USGS 1:24,000 scale topographic maps, which were made over a long period and have an average date of 1970. In other words the land surface topography depicted in them is, on average, 40 years old. For flood mapping, FEMA requires elevation data of 2-foot equivalent contour accuracy in flat areas, and 4-feet equivalent contour accuracy in rolling or hill areas. These standards correspond to root mean square errors of 0.61 to 1.22 ft, respectively. The existing National Elevation Dataset has a root mean square error of 7.68 feet. Thus, FEMA floodplain mapping standards call for elevation data that is approximately 10 times more accurate than the National Elevation Dataset. This means that the existing National Elevation Dataset, and the topographic contour information upon which it is based, are too old and inaccurate to support Flood Map Modernization, except where new high-accuracy elevation data are added from state and local sources. The Committee did not believe that ad-hoc data collection by state and local sources will create consistent elevation data of the required accuracy to fully support floodplain mapping over the nation.

The Committee concluded that a new national digital elevation data collection program is required, and called this program *Elevation for the Nation*. The Committee recommended that *Elevation for the Nation* should employ lidar as the primary technology for digital elevation data acquisition. Lidar operates by projecting short laser pulses of light from an aircraft or land-based sensor and measuring the time taken for these pulses to return to the sensor. This results in a dense cloud of measured points, some of which define the land surface while others bounce off vegetation and trees. With appropriate processing, 1-foot to 2-foot equivalent contour accuracy can be achieved in final bare-earth elevation data. This level of accuracy meets or exceeds FEMA elevation criteria for floodplain mapping in all areas. The data arising from *Elevation for the Nation* will have many beneficial uses beyond floodplain mapping and management.

Committee on FEMA Flood Maps – Mapping the Zone (NRC, 2009)

Following completion of the *Elevation for the Nation* study, FEMA and NOAA requested that the National Academies conduct a further study on flood map accuracy, and the Committee on FEMA Flood Maps was formed to address this task. This Committee addressed several subjects but I will confine my remarks to the accuracy of riverine flood mapping. Key components of the uncertainty of flood mapping are the uncertainty in hydrology (how large is the flood flow?), hydraulics (how deep is the flood water?) and topography (what is the elevation and shape of the land surface?) In collaboration with the North Carolina Floodplain Mapping Program, the Committee carried out detailed case studies to compare the hydrologic, hydraulic and topographic uncertainties in three physiographically distinct areas: mountainous Western North Carolina (city of Asheville), rolling hills in the Piedmont Region (City of Charlotte and Mecklenburg County), and in the very flat coastal plain (Pasquotank and Hertford Counties).

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The Committee concluded that the largest effect by far on the accuracy of the base flood elevation is the accuracy of the topographic data. A comparison of lidar data and the National Elevation Dataset around three North Carolina streams revealed random and sometimes systematic differences in ground elevation of about 12 feet, which significantly affects predictions of the extent of flooding. These large differences exceed FEMA's stated error tolerances for terrain data by an order of magnitude. In two of the study areas, random errors in topographic data produce inaccuracies in floodplain boundaries, but do not significantly alter the total area of the floodplain. In the other study area, in addition to random errors, there is a large systematic difference between the lidar and National Elevation Dataset data that results from a misalignment of the stream location between the base map planimetric information and the topographic data. As a result, the total areas of the floodplains defined from lidar and from the National Elevation Dataset differ by 20 percent. Because the nation's capacity to acquire earth imagery is improving faster than its capacity to acquire elevation data, the misalignment problem between imagery and elevation data is growing more acute.

FEMA is moving from simply portraying flood hazard and flood insurance rate zones on maps to communicating and assessing risk, an ambitious goal that leverages the digital flood-related information and maps produced during the Map Modernization Program. Maps that show only floodplain boundaries have the disadvantage of implying that every building in a designated flood zone may flood and that every building outside the zone is safe. Providing floodplain residents with the elevation of structures relative to the expected height of a number of floods offers a better way to define graduated risk (from low risk to high risk). Where the necessary data are available (e.g., structure elevation, base flood elevations, flood protection structure performance), a geographic information system could be used to personalize flood risk to individual addresses.

The case studies of floodplain mapping in North Carolina done by the Committee on FEMA Flood Maps showed that the best determinant of an accurate base flood elevation is an accurate land surface elevation beneath it. These case studies confirmed the general conclusion that had been drawn by the earlier Committee on Floodplain Mapping Technologies that the nation's land surface elevation data is inadequate to support floodplain mapping and improved elevation data collection is needed.

Concluding Comments

Some significant developments have occurred since the two National Research Council reports were published. I am presenting now my own opinions and assessments of these developments.

As the Risk MAP program develops, there has been a significant policy shift by FEMA to emphasize collection of better land surface elevation information as a precursor to further floodplain mapping activities. The resulting flood maps will be more accurate, and should support both the definition of the base flood elevation and the floodplain boundary.

I understand that the U.S. Geological Survey is working to facilitate an improved National Elevation Dataset over the next four years that will involve extensive cooperation among various stakeholders, including other Federal agencies, and that the Department of Homeland Security is working on a related plan for improved elevation information. I hope that these agencies will

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inform you more fully about these plans. I believe these efforts are commendable and, if implemented, will help improve flood map accuracy across the nation.

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Testimony

Flood Preparedness and Mitigation: Map Modernization, Levee Inspection, and Levee Repairs

Before the
Disaster Recovery Subcommittee
State, Local and Private Sector Preparedness and Integration Subcommittee
Senate Committee on Homeland Security and Government Affairs

Sam Riley Medlock, J.D., CFM
Association of State Floodplain Managers

July 28, 2010

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Introduction

The Association of State Floodplain Managers (ASFPM) thanks both Subcommittees, Chairwoman Landrieu, Chairman Pryor, Senator Graham, Senator Ensign, and members of the Subcommittees for your attention to the nation's flood risk, flood map, and levee issues.

As we all know, these issues have generated significant interest among the American public lately. They point to the real need to better integrate the nation's flood risk management policies and programs. This offers an opportunity to meet the challenges of flood hazard identification, aging flood "control" infrastructure, flood risk management approaches, flood insurance, and flood insurance affordability in a constructive manner – to better protect lives and property and reduce costs to taxpayers of flood disasters. We are very pleased to have the chance to share some of our thoughts on the challenges presented. Today, our testimony addresses the following:

I. Challenges & Opportunities: Levees, Maps & Insurance
II. Levees: One Tool To Managing Risk
III. Maps: Hazard Identification (with a caveat emptor)
IV. Flood Insurance & Residual Risk
V. Recommendations & Conclusion

The Association of State Floodplain Managers, Inc. (ASFPM) and its 29 Chapters represent more than 14,000 state and local officials and other professionals who are engaged in all aspects of floodplain management and hazard mitigation, including management, mapping, engineering, planning, community development, hydrology, forecasting, emergency response, water resources, and insurance for flood risk. All ASFPM members work to reduce our Nation's flood-related losses. Our state and local officials are the federal government's partners in implementing flood mitigation programs and working to achieve effectiveness in meeting our shared objectives. Many of our state members are designated by their governors to coordinate and implement the National Flood Insurance Program, and many others are involved in the administration and implementation of FEMA's mitigation programs. For more information on the Association, please visit our website at http://www.floods.org.

I. Challenges & Opportunities: Levees, Maps & Insurance

By holding this hearing on both levee and flood map issues, the two Subcommittees have recognized that they are interrelated issues. ASFPM appreciates that recognition and would add the further interrelationship with flood insurance and, specifically, affordability of flood insurance. Often because of concerns about the financial impact of requiring flood insurance, there is a very unfortunate tendency to avoid identification of risk and to focus on flood control structures as the only approach to dealing with flood hazards, despite their limitations and residual risk that still exists behind levees.

In fact, we must recognize that areas behind levees are at risk from flooding. As much as it may be desired to wish that the risk didn't exist, as much as some might find it distasteful to print a notice on a flood map that flooding can occur behind levees, as much as some might not want to even map these risk areas showing Americans that there is danger to their families and businesses in being in such areas, and even if some want to make policies to make it easier to ignore the risk (by not having mandatory purchase behind levees), the risk exists. The risk existed before the great 1927 Mississippi River flood breached levees all along the lower Mississippi (and ironically after victory had been declared over the river), the risk existed before the 1993 Missouri and Mississippi River flood (which caused more than 100 levee failures), and before Katrina. The risk still exists. It is unacceptable to ignore this risk. Levees have failed, levees are failing, and levees will fail in the future. Our policies, programs, and most importantly, our actions must recognize this risk.

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The problems with these three elements, maps, levees and flood insurance, have crystallized to create an opportunity to better manage flood risk, to better protect lives and property and to help communities and individual citizens to restore their economic and personal lives more fully and quickly after a flood disaster. This is because we are in the process of gaining a better understanding of the true status and condition of levees, flood walls and other flood control structures. Acknowledgement of the cost of repair and ongoing operation and maintenance of such structures is leading to consideration of more non-structural ways of managing flood and storm water to provide less costly protection while also using natural floodplains and gaining environmental benefits. Concern about flood insurance cost has become apparent as an important reason for concern about levee repair and updated flood maps.

If policy makers can seize the opportunity this situation presents, it could lead to:

- Better coordinated (federal, regional, state and local) flood risk management and community planning;
- Consideration of a full range of measures to address flood hazards: structural, non-structural, a mix of both, insurance that reflects the true risk in its actuarial rates;
- Improved understanding that all levees will fail or overtop at some point, so having multiple approaches to buying down the risk is important; and
- Innovative concepts and ideas for making insurance more affordable while also allowing use of actuarial rates to reflect true risk.

At present, a number of policy development efforts are underway that can contribute to development of integrated flood risk management for the nation. A National Committee on Levee Safety was created by the Water Resources Development Act of 2007. That Committee has completed its report to Congress and is in the process of developing legislative recommendations pursuant to that report. (I represent the Association of State Floodplain Managers on that Committee.) The FEMA Administrator has launched a major "Re-Thinking the NFIP" work group to collect and analyze ideas large and small for the design and implementation of the NFIP and to develop legislative recommendations. The Administration has recently re-established the Federal Interagency Floodplain Management Task Force – an entity which had been dormant for nearly 15 years but which has great potential to better integrate policy and the Council on Environmental Quality has been leading work on redesigning the fundamental Principles and Guidelines of the Army Corps of Engineers and to make the new Principles and Standards applicable to all federal agencies dealing with water resources.

II. Levees: One Tool To Managing Risk

The nation has received many "wake-up calls" on the consequences of overreliance on levees and the failure to prepare those who live behind them: the 1993 Midwest Floods, 2005 levee failures in and around New Orleans, the 2008 Midwest Floods, and more recent disasters that claimed lives, homes, and businesses, and destroyed the economic vitality of many communities. However, many other levees are in far worse shape than those in New Orleans in 2005, and the clock is ticking largely unknown to the families and business at risk, or even to many community officials.

There are five main components to the problematic use of levees in the United States today.

1. Communities and states erroneously think flooding is a federal responsibility.

2. We don't know how many miles of levees there are or their condition.

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3. The NFIP's use of the inadequate 100 year flood standard with no attendant means to address the residual risk behind the levee has led to less protective levees and encouraged development behind them.

4. Residual risk behind or below flood control structures is by and large not fully understood, leading to a false sense of security for those living behind levees.

5. Risks are increasing behind levees because development is adding to the consequences of failure or overtopping; especially those built originally as agricultural levees and are now "protecting" developing areas.

The Need for a National Flood Risk Management Policy and Framework

We will soon enter an era of levee "triage" – the process of prioritizing federal response to flood risk associated with levees and rationing scarce federal dollars on multiple-objective risk reduction projects that may include floodplain restoration, reconfiguration of structural systems, and combinations of approaches to make the best use of limited public resources. Response to the levee crisis – and smart investment of limited public dollars - must entail evaluation of the full range of measures to reduce risk, including flood insurance, changes in land use, and strategic relocation from areas of greatest risk. Such evaluation will require national policy and leadership in flood risk management, beyond the scope of a levee safety policy or program. A complete inventory of all of the nation's levees – federal, nonfederal, and private – is the first step to conduct the levee triage that will be necessary so that everyone, including Congress, understands the scope of the crisis we face.

Although the National Levee Safety Act of 2007 provided for the development of a policy framework for levee safety, the National Committee on Levee Safety struggled to identify and operate within its mission parameters in a policy vacuum; with no national flood risk management policy to guide decision-making beyond the levee footprint. While the Committee recommendations on governance, engineering, and outreach help guide decision-making once the decision is made to build a levee, the report provides no insight to guide the important decision of whether or not to levee an area to protect against floods, or how a levee may be combined with nonstructural measures or if a levee should be built at all.

The NCLS report to Congress calls for a new federal fund to match state and local dollars to help address the many levee deficiencies anticipated across the nation. Despite enormous past investment in flood "control" structures, that spending has been outpaced by development in risky areas and development in the watershed that increases runoff and flooding, and by the steady deterioration of those structures. As the public grows to recognize the risks associated with levees, communities are working to evaluate the various actions they can take in response to those risks: levees can be repaired and improved or set back from the river to relieve pressure and erosion on the levee; homes, businesses, and infrastructure at risk can be relocated to reduce risk and restore floodplain function; waters can be detained upstream; and measures can be combined to achieve the most effective results with scarce public dollars. The NCLS recommends, and ASFPM supports, creation of a National Levee Rehabilitation, Improvement, and Flood Mitigation Fund to provide cost sharing support for state and local efforts to address levee deficiencies and reduce flood risk.

Along with the challenges of the unknown levels of protection of levees and of their condition, many local governments are facing the de-accreditation of their levees, for purposes of recognition under the NFIP. More than 300 (of over 900) communities are facing the impending expiration of agreements regarding their Provisionally Accredited Levees, or PALs. The result of having a levee that is not accredited as providing flood protection is that the area behind that levee will be mapped in the "without–

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levee" condition and will be designated a Special Flood Hazard Area subject to appropriate flood insurance requirements and land use measures to prevent and mitigate flood damage.

Unfortunately, an issue has emerged in recent years that hinders the potential effectiveness of this existing system of incentives to prevent harm: the misperception that flood insurance is an unnecessary burden on those living behind levees. Levees are designed to provide only a specific level of protection. They can fail in any flood, or be overtopped in larger flood events, which is why relying solely on levees leaves those living behind them subject to significant and poorly understood risks. Everyone should understand the risk to life and property that remains behind levees—risks that engineers acknowledge that even the best flood-control system cannot completely eliminate.[1] In its recently adopted Resolution on levee safety, the American Society of Civil Engineers amplified the need for public understanding and better management of the nation's flood risks, emphasizing that:

> [R]isk communication is especially important in situations such as levee construction where the community is often emboldened by an erroneous sense of security to greatly increase development in areas protected for a time by levees; and at the same time the consequences of such failure have dramatically increased due to flood depth and velocities which accompany such failures.

III. Maps: Hazard Identification (with a caveat emptor)

The purpose of FEMA's mapping program is to provide people living and working behind levees with appropriate risk information so that they can make informed decisions to minimize economic loss, damage, and loss of life. As noted above, the 1%-chance standard for flood insurance rating purposes is not a safety standard. Although a newly imposed requirement to purchase flood insurance is an additional cost for those living at risk, it is only appropriate that those at risk be informed and insured and bear part of the cost of living at risk. The affordability problem must be dealt with outside of identification of risk.

The poor condition of much of the nation's infrastructure, including levees, dams and other flood control structures, as well as stormwater facilities, has become more evident. More accurate flood maps now reflect the unreliable flood protection of levees and the effects of development by showing some areas as now in the 100-year flood hazard area (and, conversely, by showing about an equal number of structures as no longer in the 100-year flood hazard areas). It is important to note that almost as many properties are newly shown as out of a Special Flood Hazard Area (SFHA) as are newly shown as in the SHFA. Requirements for the purchase of flood insurance in areas newly shown as at risk of flooding are highlighting concerns about affordability of flood insurance.

As a former community and regional planner, I can speak firsthand to the importance of flood maps in reducing the loss of lives and property in floods. I can also speak to the need for local officials to be able to interpret flood maps, and understand that no map can ever predict exactly where floodwaters will go – the simple fact is that maps are based on models and the best available data. As engineering models improve and the body of data about a given basin grows, floodplain delineations can and do shift. This can be due to changes in hydrology, impervious cover, or other physical changes in the basin. However, it can also be due to the availability of new data that may more accurately depict how floodwaters would likely move through a valley. Ultimately, floodplain mapping is not a perfect science. It falls to communities to make informed and reasonable decisions about where and how to grow.

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[1] See American Society of Civil Engineers Resolution 529, adopted Jan. 25, 2009, available at http://www.asce.org/pressroom/news/policy_details.cfm?hdlid=527.

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IV. Flood Insurance & Residual Risk

ASFPM applauds the constructive examination of the National Flood Insurance Program (NFIP) launched by FEMA Administrator Craig Fugate. Administrator Fugate has recognized both the value of the NFIP and the need for a new phase of program growth and adaptation to changing circumstances. During a Listening Session on the future of the NFIP last November, Mr. Fugate challenged over one hundred invited participants to think creatively about the overall value of the NFIP, what it was intended to achieve, what is has and has not accomplished, and needed changes, both small and large. One example to encourage thinking big was whether or not the private sector could now handle and provide flood insurance. Mr. Fugate has subsequently charged a FEMA working group with assembling the recommendations, analyzing their merits and feasibility, and then developing substantive recommendations for moving the NFIP forward. The working group will evaluate not only the suggestions from the recent and additional Listening Sessions, but also the recommendations of a multi-year NFIP Evaluation led by the American Institutes for Research, the results of several Government Accountability Office Studies, Congressional Research Service studies, and other reports. FEMA expects to have a number of substantive additional reform proposals ready for Congressional consideration within the next two years, upon which we urge your timely consideration.

Flood insurance should gradually move toward being actuarially sound to reflect actual risk and enable market-based financial decisions about how much risk-related cost to assume. We recognize that there are affordability problems for some citizens living in at-risk areas; this is more prevalent in older riverine areas than in recently developed coastal areas or some newly developed areas behind levees. The de-accreditation of levees and more accurate flood maps have highlighted the affordability issue. We do not support efforts to delay issuance of flood maps, withholding accurate information about flood risk from citizens living and working in hazardous areas. We suggest that this issue presents challenges, but ones that can lead to constructive new growth and adaptation for the NFIP if addressed correctly.

A number of very interesting ideas have emerged from academia, from a local levee district and from discussions among practitioners and policy makers. Most need further development, but they illustrate the kinds of ideas that could help to address the affordability issues and thereby facilitate better flood risk messaging, planning, and mitigation. Consider a number of interesting ideas to address the affordability problem.

- A program of flood insurance vouchers to assist with purchase of flood insurance issued through a means-tested program could be administered by the Department of Housing and Urban Development. An analysis might show it would be less costly for the taxpayer to pay for flood insurance vouchers for low income property owners for a limited time rather than have the taxpayer continue to pay disaster costs from the Disaster Relief Fund every time that a community floods

- Group flood insurance policies for areas behind levees. Levee districts could include the cost in their tax or fee structure and purchase the policy for those behind the levee. This would both signal to property owners that there is a residual risk while also protecting them in the event of levee failure or overtopping.

- Community group flood insurance for Special Flood Hazard Areas. Communities could purchase group policies for areas within their jurisdiction identified as SFHAs, thereby insuring everyone in those areas, not just those with federally backed mortgages. This would enable more rapid recovery of the area following a flood disaster. It would also offer an incentive to local officials to take steps to reduce losses and discourage unwise development because such actions would result in a lower cost group policy.

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V. Recommendations & Conclusion

Ultimately, any national levee safety policy will function best within the context of an overarching national flood risk management strategy, and risks failure without it. The best engineering and evacuation planning will not be sufficient to ensure that existing levees and activities they are intended to protect are well managed, and that any new levees are appropriately selected as just one part of an overall strategy to manage flood risk in a given community. The Report of the National Committee on Levee Safety provides Congress with important insights to help drive at least some of the next steps for the nation. ASFPM and its members stand ready help Congress meet the challenges identified in the report that related to levees, and the overall physical, political, environmental, economic and social landscape in which they operate.

1. **Flood insurance must be mandatory behind levees. Also, such flood insurance policies should be actuarially rated which will reflect the true risk – whether residual or something more.**
2. **Flood maps must reflect flood risk accurately and must be published without delay to inform those inhabiting such areas – including areas behind levees.**
3. **Communities choosing levees as their form of mitigation must accept responsibility for their choice and better mechanisms need to be developed to reward communities who take this responsibility seriously (better cost shares, eligibility for funding) versus those who don't.**
4. **Congress should establish a National Levee Safety Program that incentivizes states to take responsibility since land use authority resides at the state and local levels.**
5. **If discounted rates are applied for areas newly mapped as floodplain, FEMA could provide information as to eventual actuarial rates as well as information about mitigation actions which could be taken in the interim to reduce eventual actuarial rates.**

To actually reduce flood-related loss of life and property in the nation, we must move toward a true flood risk management framework with the nation's policies and programs. A comprehensive flood risk management program recognizes that:

- **Managing flood risk is a shared responsibility among individuals, the private sector, community, and** state and federal government;
- Flood risk is not isolated to the 100-flood hazard area but is rather a continuum of risk that crosses all risk and jurisdictional lines on a map;
- Development and other activity outside the 100-year floodplain impacts flood levels—if we only manage activity in that 100-year floodplain, we miss opportunities to save lives and reduce flood damages and impacts;
- All structural protection measures will fail or be overtopped at some point by some flood event;
- Managing flood risk requires consideration of a mix of measures that may include structures, avoidance, and even retreat from high risk areas. Selection of only one structural measure, such as a levee, leads to severe losses in catastrophic events. Levee failure and high storm surge and 500-year events have shown the need for a mix of approaches including elevation, insurance and structures;
- Flood levels will increase in the future because development increases runoff; and observable trends indicate that storms are intensifying;
- Flood risk will increase as the natural resources and functions of floodplains are altered by development since this destroys the natural system that reduces the negative impacts of flooding;
- Flood risk management includes concepts such as identification of flood risk, community planning to steer development away from areas of risk, basing flood insurance on actual risk, vigorous promotion and support of hazard mitigation actions, and enabling citizens to better recover from disasters by being insured to reduce their financial risk.

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The nation must carefully balance the issue of who benefits and who pays for development at risk. There are about 130 million housing units in the U.S. Of that about 10 or 11 million are in flood hazard areas. Of those in flood hazard areas, roughly half carry flood insurance. This means 90% of the population does not live in identified Standard Flood Hazard Areas, but continues to pay a large amount each year for disaster relief for flooding, rebuilding damaged infrastructure in flood areas, and may have to cover the $18 billion debt of the NFIP. Yet those same taxpayers obtain few, if any, of the benefits of that development. This points out the need to tie program outcomes of the NFIP to these other programs like disaster relief programs and programs of HUD, DOT, USDA and others.

The Association of State Floodplain Managers appreciates the opportunity to share our views, recommendations, and concerns with you. We hope these observations, based on our collective experience in working to reduce flood risk in the nation and in serving as your partner, will be helpful in your work. We look forward to answering any questions you may have and assisting the Subcommittees in any way that you find helpful. I can be reached at: (608) 692-5010 or at: sam@floods.org. Our website is: www.floods.org.

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COMPLETE STATEMENT

OF

ROBERT G. RASH, P.E., P.L.S.
CEO/CHIEF ENGINEER
ST. FRANCIS LEVEE DISTRICT OF ARKANSAS

BEFORE THE

SUBCOMMITTEE ON DISASTER RECOVERY
AND
THE SUBCOMMITTEE ON STATE, LOCAL, AND
PRIVATE SECTOR PREPAREDNESS AND INTEGRATION

UNITED STATES SENATE

ON

ST. FRANCIS LEVEE DISTRICT
MISSISSIPPI RIVER AND TRIBUTARIES PROJECT

JULY 28, 2010

INTRODUCTION

Madam Chairman, Mr. Chairman and Members of the Subcommittee, I wish to thank each of you for the invitation to be here today and to discuss with you the different concerns that we as Local Citizens have with the FEMA flood map modernization process. My name is Rob Rash, I'm a Professional Engineer and currently serve as the Chief Executive Officer and Chief Engineer of the St. Francis Levee District of Arkansas with Headquarters in West Memphis, Arkansas. It may be of information for this Subcommittee to know that our Levee Board has been in existence since 1893 and my area of responsibility lies in the Delta Area of extreme North East Arkansas and covers seven (7) Counties with 160 miles of Main Line Mississippi River Levees and 75 miles of St. Francis River Tributary Levees.

HISTORY OF MR&T

The previously described levees are a part of the Mississippi River & Tributaries Flood Control Project which contains a total of 3,787 miles of Levees along with other structures such as Floodwalls, Floodways, Floodplains, Diversions, Reservoirs, Pumping Plants and every other proven method to prevent flooding from the 41% of the waters of the United States that flow to the Gulf of Mexico. Since the MR&T Project is a unique, one of a kind Federal Flood Control Project let me just say that the Law that established the Project states that the project for flood control of the Mississippi River in its alluvial valley is adopted and authorized as set forth and recommended in the report submitted by the Chief of Engineers and printed in House Document Number 90. That document states that the Flood used in the design of this plan is that predicted by the Weather Bureau as the "maximum possible" and by the Mississippi River Commission as the "maximum probable". For the sake of time I have not quoted the Law nor the Document exactly nor in their entirety. It may be well to partially quote a little more of the Law that says that the works and outlets constructed under the provisions of this Act shall be built in a manner and of a character which will FULLY and AMPLY protect the adjacent lands. This law and this Project has served the Country well because for the past 82 years no Project Levee built to MRC Standards has ever failed despite Major Floods in 9 of those years, some of Record Proportions.

FEMA MAP MODERNIZATION

As I'm sure you all know, Flood Maps are not new to us. The thing that is new is the fact that all the area that lies behind the Levees within the boundaries of the St. Francis Levee District of Arkansas on the old Flood Maps were Zone X which meant that the area was protected to a 500 year flood and there was no need for Flood Insurance. Now that same area has a new designation known as Shaded Zone X which we are told means that Flood Insurance is not MANDATORY but is RECOMMENDED. History shows us that when Insurance is recommended to the Mortgage holder or Lender then they insist that Insurance be purchased.

The millions of citizens that have and those that do now inhabit the Alluvial Valley of the Lower Miss. River have paid Levee Taxes for over 100 years; they consider that these taxes have been paid in lieu of Flood Insurance. The Levee Taxes are collected and expended by the Levee Boards to finance the day-to-day Maintenance of the Levees. It is of great concern

to us that the citizens of the Valley are not going to purchase Flood Insurance AND pay Levee Taxes (the local peoples investment on our local levee system since we began building it in the early 1800's is in excess of $17 Billion, which includes the building of the original levee and maintenance over the last 150 years.

If our fears are valid then the day-to-day maintenance will cease and the Levees will deteriorate and the entire 35,000 square miles of the Lower Miss. River Valley will be periodically flooded and not fit for human habitation. This will create an economic disaster that this Country has never experienced. The Flood Plain of the Lower Mississippi River is in places 100 miles wide and averages 50 miles wide and is 600 miles long. The Flood of 1927 stopped all East-West Commerce for a period of about four months. In today's economic environment, the cost to this Country is beyond comprehension. Quoting our friends and neighbors in Louisiana: "Without Flood Control, Nothing Else Matters."

CONCLUSION

In my letter of invitation to appear before this Committee I was asked for my recommendations. My first recommendation would be that FEMA use the best Engineering and Hydraulic Information available in their revisions of the Flood Rate Insurance Maps and that they discontinue their practice of considering every Flood Protection Area in the Nation as being the same when in fact every area is different. FEMA needs to take into consideration what has been done to protect against Floods and they also need to consider what the demands for the sale of more and more Flood Insurance will have on the economy of the Nation. We are aware of the need that FEMA has to collect funds but we are also aware of the consequences that their present actions will have on the future of the Nation, especially in the rich alluvial valleys that produce so much that is necessary in our day to day lives, including but not limited to the majority of the food and fiber required. The Mississippi River is a critical natural resource and one of our Nation's greatest assets. At 2,320 miles it ranks as one of the world's largest rivers supplying eighteen million people with drinking water and linking agricultural, timber, coal and other producers to markets around the world. Each year, the Mississippi River valley generates more than $12 billion in agricultural and forest products and $213 billion in manufacturing goods.

Anglers, boaters, hunters, bird-watchers, tourists, and other enthusiasts pour another $20 billion into the 10 states that border the river. The river also supports a myriad of wildlife. It is a vital migration corridor for 40 percent of all North American waterfowl and 60 percent of North America's bird species. In all, the Mississippi River basin supports 25 percent of all fish species in North America and a high diversity of freshwater mussels.

I shall end my Statement with that thought and will be happy to attempt to answer any questions the Committee may have.

RECENT LOUISIANA EXPERIENCE WITH THE NFIP

Joseph N. Suhayda
Interim Director
LSU Hurricane Center
Louisiana State University

Testimony before the
Senate Ad Hoc Subcommittees
on
DISASTER RECOVERY
and
STATE, LOCAL AND PRIVATE SECTOR PREPAREDNESS AND INTEGRATION

Hearing Title:
FLOOD PREPAREDNESS & MITIGATION:
MAP MODERNIZATION, LEVEE INSPECTION, and LEVEE REPAIRS
July 28, 2010

I am pleased to have the opportunity to testify before you today on behalf of the State of Louisiana and Parish Governments I have assisted. In my testimony today I will briefly give an overview of the issues faced by communities in Louisiana as they cope with flood map development and appeals, levee certification and the special role of coastal restoration in flood protection. For Louisiana I believe there has never been a more critical need for expanding the working partnership between the State of Louisiana and the federal government. My recent experience includes serving as chairman of the Independent Technical Review committee of the joint FEMA/COE storm surge study that produced the current preliminary DFIRM maps for Louisiana and assisting in the preparation of DFIRM appeals for several communities including Morgan City, Cameron Parish, Terrebonne Parish, St. Tammany Parish, and Lafourche Parish.

Accuracy of FEMA Flood Map Modernization Process

The issuing of the preliminary DFIRMs over the last few years by FEMA has resulted in local governments individually respond to these new maps. Several deficiencies in the preliminary DFIRMs were noted in the community appeals including technical issues such as the accuracy of the topographic and bathymetric data, still water elevations, and wave heights used in developing the DFIRMs. Also of concern was the treatment of coastal landscape features and non-levee structures. The continued use of the WHAFIS wave model was also questioned. Finally, procedural issues were noted relating to how consistently the FEMA mapping guidelines were followed. Many, but not all, of these appeal issues are now being addressed by FEMA and new maps will be issued shortly.

Mechanisms for Dispute Resolution

Parishes throughout the state have had problems with trying to get FEMA to communicate with them during the preparation of the maps and with cooperating regarding the DFIRM appeal process. This is causing delays in many economic

development project, disaster recovery (public assistance projects in V-zones) and flood protection projects for these communities. Interpretation of the plain language of the FEMA regulations has been a continuing problem. The Louisiana congressional delegation has become involved and requested from the FEMA Administrator that FEMA start a series of meetings with the parishes. FEMA did this and has created a greatly improved process for resolving appeal issues.

Levee Inspection and Certification

Compounding the flood plain management problems the parishes must deal with is the issue of levee certification. This issue has resulted in the exclusion of formerly accredited levees in the new DFIRMs resulting in a radical change to the BFEs for many communities. However, dealing with levee certification is an issue that exceeds the capabilities and willingness of most of the communities to deal with. Congressional authorization for federal levees providing less than 100 year flood protection is a problem.

Coastal Restoration Projects and Coastal Non-Levee Structures

Coastal restoration projects are seen by both the federal government and the state as means for reducing the threat of hurricane flooding, however receiving credit for these projects by the Corps of Engineers has been a problem. Also, more clarification is also needed as to how to include coastal structures such as roadways, non-hurricane protection levees and non-certified levees in the map modernization process.

There are several programs within the National Flood Insurance Program that would benefit communities in Louisiana if a more coordinated state and federal cooperation were established. Communities should be assisted in developing the means to prepare LOMAs, LOMRs, CLOMRs, physical map revisions, and PALs. Furthermore, FEMA allows communities located in "sheltered waters" to receive special treatment in delineating the 100 year floodplain which includes most of coastal Louisiana. Implementing this designation needs to be addressed.

Therefore I am advocating that FEMA and the Corps of Engineers work with the State of Louisiana to develop the capability for the State to coordinate flood plain management activities, effectively take advantage of all of the opportunities within the NFIP including financial support, and take charge of future flood plain mapping. Foremost in accomplishing these objectives would be the establishment of a Cooperating Technical Partners (CTP) Program with Louisiana that would include ongoing map modernization.

Thank you for giving me the opportunity to make recommendations.

Post-Hearing Questions for the Record
Submitted to Jo Ellen Darcy
From Senator Mary Landrieu

"Flood Preparedness and Mitigation: Map Modernization, Levee Inspections and Levee Repairs"
July 28, 2010

Local Levee Inspections & Certifications

1. Testimony from witnesses on the next panel indicates that the Corps conducts annual inspections of local levees, but generally will not accredit their safety to FEMA, which forces communities to hire an engineering firm instead. 300 accreditations are due to expire in the near future. I need you to help me get to the bottom of these concerns about duplication of effort between FEMA and the Corps of Engineers during the re-mapping phase. You indicated that the Corps Levee Safety Program provides for comprehensive "periodic inspections" every five years under the supervision of a professional engineer for levees in the federal system, whereas it only provides for less rigorous "annual inspections" of local levees.

- So how much more effort and expense would it take for the Corps to kill two birds with one stone during the course of these "annual inspections," by conducting the additional checks necessary to "certify" the levees instead?

Answer: Levee certification for the National Flood Insurance Program (NFIP) focuses on only the 1% annual chance exceedance flood, also referred to as the 100-year or base flood. Corps levee inspections focus on verifying if the levee will perform as designed, which could be for levels above or below the 100-year flood. Some criteria for certification not covered by a Corps levee inspection include levee height determination, seepage analysis, embankment stability analysis, settlement analysis, and interior drainage. Costs for such activities could vary greatly for each levee system. Recently designed and constructed levee systems will have data readily available so that levee certification determination and documentation may be more efficiently accomplished. Levee systems that are aged (many are 50 years or more since construction), have no records of engineering design or as-built construction documents, and have no extensive documentation of performance and may require extensive investigations and studies to make a technically valid determination.

The Corps will provide all available levee data and inspection reports to the local levee sponsor; however, the Corps and FEMA agree that the local levee sponsor or community wishing to have a levee system recognized on the FEMA Flood Insurance Rate Map (FIRM) is responsible for providing all the required documentation to FEMA demonstrating that the levee system meets the requirements of 44 CFR 65.10. Therefore, the local levee sponsor is responsible for providing the additional information and analysis needed beyond a Corps levee inspection. There are two instances when the Corps may conduct levee certifications if requested by a local community - (1) the Corps operates or maintains the levee system (such as the Mississippi River & Tributaries levees) or (2) the Corps has an active levee design/construction project underway

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(such as New Orleans). The Corps may perform levee certifications using funds provided by non-federal sponsors, provided that it can be demonstrated that the Corps is uniquely equipped to do so and that such services are not reasonably and quickly available through ordinary business channels.

The Corps established its Levee Safety Program with the mission of assessing the integrity and viability of levees, and recommending courses of action to make sure that levee systems do not present unacceptable risks to the public, property and environment. The 100-year flood requirement for NFIP levee certification is not a safety standard for levees. It is for flood insurance purposes. The Corps focuses priorities on risk based activities of its Levee Safety Program.

2. You also described a very restrictive threshold that must be met to secure Corps of Engineers assistance. Your statement reads "Certification of levees that are operated and maintained by entities other than the Corps is to be provided by the local levee sponsor. The Corps may perform levee certifications using funds provided by non-federal sponsors if the local sponsor can demonstrate the Corps is uniquely equipped to do so and that such services are not reasonably and quickly available through ordinary business channels."

- What is the legal basis for determining that the Corps is prohibited from helping unless all these conditions have been met?

Answer: For situations in which a non-federal sponsor would like to provide the Corps funding to perform a levee certification for the NFIP, the provisions of Section 211 of the Water Resources Development Act of 2000, as amended, (known as the Thomas Amendment) apply. The Thomas Amendment makes the Corps' ability to accept non-Federal funds contingent upon the facts and circumstances of each request. It provides that the Corps may provide technical services to state or local governments under the Intergovernmental Cooperation Act (31 U.S.C. 6505) only upon (1) a written request for services and agreement to pay all costs associated with the services and (2) attestation that includes adequate facts to establish that the services requested are not reasonably and quickly available through ordinary channels. It further requires that based on the facts, it must be established that the Corps is uniquely equipped to perform such services.

- Has the Corps of Engineers reduced the level of assistance it provides for local levee "certifications" since Hurricane Katrina in 2005, and did liability concerns play a role in that decision?

Answer: Before January 2008, if requested by the non-federal sponsor and if funds were available, the Corps provided levee certifications for levees within its program authorities to FEMA, typically at the completion of construction of a project. In January 2008, the Corps decided it would no longer perform levee certifications for the NFIP, except for levees operated and maintained by the Corps or for levees under construction by the Corps, because of the need to focus limited funding on its Levee Safety Program and recognizing that certifications are a local responsibility. Liability concerns did not play a role in this decision. The Corps policy is based on the non-federal sponsors' responsibility to provide certification to FEMA and the need to prioritize limited funding to focus on Levee Safety Program activities.

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Local Levee Repairs

3. The National Committee on Levee Safety has recommended the creation of a National Levee Rehabilitation, Improvement, and Flood Mitigation Fund to match state and local dollars and address non-federal levee deficiencies around the nation.

- Do you agree that a larger cost-sharing program should be established to help finance local levee repairs?

Answer: Currently, the Administration position on the National Committee on Levee Safety recommendations is under development.

4. The Corps of Engineers' current programs seem to only assist communities with levee repairs after they've been damaged by a flood event.

- Shouldn't our programs focus on fixing levees *before* they're damaged or overtopped in a flood?

Answer: Concur and the Corps Levee Safety Program does focus on identifying deficiencies before a flood event. The Corps conducts levee inspections with local sponsors, to

1) ensure that the levee system will perform as expected.
2) identify deficiencies or areas that need monitoring or immediate repair.
3) continuously assess the integrity of the levee system in order to identify any changes over time.
4) collect information in order to make informed decisions about future actions.
5) determine eligibility for federal rehabilitation assistance for the levee in accordance with PL 84-99. Levees with an acceptable or minimally acceptable inspection rating are eligible for levee rehabilitation assistance for certain damages incurred during a flood event.
6) determine if the levee is being properly operated and maintained.
7) determine if the local sponsor is in compliance with the project partnership agreement, if applicable.

For the vast majority of the levees within Corps' programs, the non-Federal sponsor is responsible for operation, maintenance, repair, replacement, and rehabilitation of the levee and for correcting any deficiencies identified.

An option to assist levee sponsors in developing a path forward after a deficiency has been identified is the Corps' Silver Jackets Program. Through this program an interagency team in each state is being established with representatives from FEMA, the Corps, the state National Flood Insurance Program coordination office, and the state hazard mitigation office. This provides a framework to leverage resources and collaborate on solutions. The goal is to have a team in each state.

Howard Hanson Dam

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5. The Howard Hanson Dam was built in 1947 against a hill in Northwest Washington State – and has leaked almost since the dam began operating in 1961. In 2009, the Corps detected a new leak after a significant rainfall, leading to the dam being classified as "unsafe, with an urgent and compelling need for immediate action." A double-thick grout curtain was being installed last fall, and the Corps was in the initial stages of designing and building a permanent fix to the Howard Hanson Dam.

- Please discuss the actions being taken by the Corps to address this situation, and if the grout curtain has been a successful stop-gap measure. What is the timeline for a complete repair to the dam?
- Has Congress provided the Corps with the necessary financial means and legal authorities to ensure that the Howard Hanson Dam and other dams across our nation are safe?

Answer: Howard Hanson Dam, which was authorized in 1950 and completed in the 1960s, has had seepage occur in the natural materials of the right abutment. Evidence of potential dam safety concerns was noted during the January 2009 record pool, including depressions on the right abutment and increased sediment in flows entering the drainage tunnel. The Corps constructed drainage improvements and a grout curtain in 2009, and these measures underwent testing in the spring of 2010. Tests showed that the repairs completed to date have improved the control of seepage through the area of concern. However, the grout curtain is not considered a permanent solution. Simultaneously, the team has performed test borings, geotechnical modeling and analysis, and screened alternatives to develop a long-term repair plan. A dam safety modification study is underway to support and document decisions. The Corps has determined that additional corrective actions are needed to restore the dam to a safe condition and to provide full flood storage capacity. Construction is expected to begin before the end of 2010 of some additional measures to help further reduce risk including rehabilitation of the existing right abutment drainage tunnel including the installation of additional filtered drains and construction of an extension of the existing drainage tunnel.

The Corps is authorized to address dam safety issues at Corps-constructed dams. However, funding is limited to address the concerns of the full USACE inventory of dams. The limited funds are being prioritized by risk informed decision making to direct efforts to the highest risk projects first. Interim measures are employed as needed for dams with significant dam safety concerns to lower pool or heighten observations as appropriate for the specific dam. The Howard Hanson Dam study has been fully funded. Funding provided in the recent Supplemental Appropriations Act will allow construction of additional risk reduction measures. Future funding needs will be identified when the dam safety modification study is completed and approved, anticipated in January 2011. Dams constructed and regulated by other entities are the responsibility of those entities for ensuring the safety of those structures.

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Post-Hearing Questions for the Record
Submitted to the Honorable Darcy
From Senator Mark Pryor

"Flood Preparedness and Mitigation: Map Modernization, Levee Inspections and Levee Repairs"
July 28, 2010

1. Can you give an overview of how and when the Corps becomes involved in the flood map modernization process? I'm interested in both the public outreach aspect and the technical aspect regarding levee certifications.

Answer: Both the US Army Corps of Engineers (Corps) and the Federal Emergency Management Agency (FEMA) have a long history of partnering on flood plain mapping as part of the National Flood Insurance Program (NFIP). Over the past 30 years, the Corps has completed numerous Flood Insurance Studies for FEMA's flood plain mapping purposes. In August 2005, both agencies signed an agreement that further streamlined the process for the Corps to provide flood plain mapping and other related services to FEMA.

The Corps and FEMA relationship has continued all throughout FEMA's Map Modernization Program (MapMod). At the beginning of MapMod, the Corps and FEMA leadership met and set the following goals for working together –

- To ensure a common Federal front for working with stakeholders in dealing with flood risk management.
- To define where and how Corps and FEMA can partner.
- Identify immediate areas where partnering will be essential for mapping, levee certification, and the National Levee Database.
- To start planning ahead to share information via FEMA regions and Corps districts.

As a result, both agencies have been very successful through MapMod in leveraging data, partnering on flood plain mapping studies, collaborating on related policies and jointly communicating flood hazard information to the public.

Specifically for levees, early in MapMod it became evident that areas behind levees shown as providing protection from the 1-percent-annual-chance (base) flood would require special attention. FEMA recognized that many levees have changed considerably or deteriorated since the current effective maps were published. Corps and FEMA have coordinated overlapping levee related activities when possible. Example national activities include collection of levee information for the National Levee Database; coordination of internal levee related policies; national video-teleconferences to discuss related policies and establish a common understanding; joint Corps/FEMA presentations at national conferences such as those sponsored by the Association of State Flood Plain Managers (ASFPM) and the National Association of Flood and

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Stormwater Management Agencies (NAFSMA); quarterly leadership meetings to discuss and resolve issues; and coordination on public outreach materials such as brochures and fact sheets.

The Corps and FEMA, however, recognize the critical public outreach activities must be implemented at the local level – among FEMA regional offices, Corps districts, and local stakeholders. Because of this, Corps and FEMA made sure that internal policies emphasized the importance of the establishment of these local partnerships and close coordination. For example, a June 2006 policy to Corps districts states "USACE MSC and district offices are encouraged to develop partnerships with their counterpart FEMA MapMod colleagues to foster close coordination and collaboration on map issues of mutual interest." Additionally, in Corps funding guidance for its Levee Safety Program, "Continue supporting the Federal Emergency Management Agency (FEMA) regions and local sponsors regarding the Map Modernization Program and Provisionally Accredited Levees (PALs) as required," is identified as one of the priority activities.

There are three categories of levees within the Corps authorities, *regardless of design level*:

1) Federally authorized levees, which the Corps operates and maintains.
2) Corps constructed (or authorized to be within the Corps program)/locally operated and maintained.
3) Locally constructed/locally operated and maintained in the Corps PL 84-99 Rehabilitation and Inspection Program.

Certification requirements for FEMA's NFIP involve only levees designed for or above the 1% annual-chance flood (or base flood), *regardless of authorization or entity responsible for maintenance*. Therefore, the Corps may be involved for those levees in one of the three categories above that are designed for or above the base flood.

FEMA has established a specified period of time, known as its Provisionally Accredited Levee (PAL) policy, that allows the community or levee owner time to collect and submit data and documentation to meet the certification requirements of 44 CFR 65.10. FEMA's PAL policy outlines scenarios and the corresponding PAL process involving levees within the Corps authorities.

Because the local community is responsible for administering the provisions of the NFIP and for maintaining the levee (with the exception of Federally operated and maintained levees in category 1 above), providing FEMA with certification documentation is a local choice and responsibility. There are two instances when the Corps may conduct levee certifications if requested by a local community - (1) USACE operates or maintains the levee system (such as the Mississippi River & Tributaries levees) or (2) USACE has an active levee design/construction project underway (such as New Orleans). Additionally, the Corps may perform levee certifications using funds provided by non-Federal sponsors, provided that it can be demonstrated that the Corps is uniquely equipped to do so and that such services are not reasonably and quickly available through ordinary business channels. For these levees the Corps will follow its process for evaluating levees for NFIP purposes. The Corps process is consistent with and founded on the principles of FEMA's requirements in 44 CFR 65.10 while updating methods and references to current Corps practices and criteria.

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For other levees within the Corps authorities, the Corps will provide available data such as as-built drawings, design documentation, and past inspection reports to the local sponsor to support their certification efforts.

A common question is how Corps levee inspections relate to levee certification for the NFIP. Inspection of a levee, as related to the Corps Levee Safety Program, is a visual inspection conducted to verify that the levee system is being properly operated and maintained. The levee system sponsor must continually perform appropriate operations and maintenance (O&M) of the levee to ensure the levee will perform as intended. Proper O&M is only one of the certification criteria outlined in 44 CFR Section 65.10. Other criteria for certification, not covered by a Corps levee inspection, include levee height determination, seepage analysis, embankment stability analysis, settlement analysis, and interior drainage.

Coordination with the local sponsor occurs at the local level depending on the need. Many joint Corps and FEMA public meetings and workshops have occurred around the nation – depending on, for example if the purpose is related to FEMA's mapping process, a workshop to share levee information, or a meeting to discuss the results of Corps levee inspections.

Additionally, the Corps has initiated a Silver Jackets Program. This program is helping to establish an interagency team in each state with a representative from FEMA, the Corps, the state National Flood Insurance Program coordination office, and the state hazard mitigation office as standing members and lead facilitators. Other agency representatives may vary based on the current team focus. This program is used to establish relationships when they do not exist, strengthen relationships that need improvement, and supplement and expand already successful teams. This allows the agencies to focus on the needs of the state to reduce hazards and flood risk. To date there are 20 active state teams. The goal is to have a team in each state.

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Post-Hearing Questions for the Record
Submitted to Sandra Knight
From Senator Mary Landrieu

"Flood Preparedness and Mitigation: Map Modernization, Levee Inspections and Levee Repairs"
July 28, 2010

Map Accuracy

1. Dr. Maidment's written statement makes several statements about elevation data that I would like to paraphrase aloud. "Base flood elevations are only shown on floodplain maps that have been prepared with high quality land surface elevation information and detailed flood modeling studies. Maps that show only floodplain boundaries have the disadvantage of implying that every building in a designated flood zone may flood and that every building outside the zone is safe. Providing floodplain residents with the elevation of structures relative to the expected height of a number of floods offers a better way to define graduated risk…Where the necessary data are available…a geographic information system could be used to personalize flood risk to individual addresses."

- What percentage of the updated maps includes high quality elevation data, as opposed to just boundary lines?

Response: Under the Flood Map Modernization program, FEMA has migrated 845,000 miles of mapped floodplains to new digital flood maps. Of these floodplains, 236, 000 miles (28%) have published Base Flood Elevations (BFEs). Going forward, FEMA has committed to calculating the 100 year flood elevation for all new floodplain analyses under Risk MAP. Though FEMA may not require communities to adopt these elevations as a component of the official flood hazard map in all cases, the information will be available to local officials for floodplain management decisions.

- How close are we to realizing this vision of providing personalized risk information to individual residents, and do you think it's feasible to achieve this?

Response: Risk MAP will also be producing maps of flood depths. These non-regulatory products will provide estimated depth information. Flood risk is directly proportional to depth, so this information will provide homeowners, businesses, local officials and others much easier access to personalized risk information within and outside of the special flood hazard area.

Community Outreach

2. In addition to holding town hall meetings, I'm wondering whether FEMA sends letters to existing policyholders within a community to inform them that their area is being remapped. This approach wouldn't be a substitute for in-person meetings or cover everyone in the community, but it seems like a common-sense method of contacting stakeholders to get them

engaged in the process early on. Mapping notifications could be included in the mail with annual policy statements.

- Does this proposal strike you as one that's viable, cost-effective, or worthwhile?

Response: FEMA supports and engages in a varied approach to outreach to communities and local citizens through the flood map review and adoption process. These activities are performed in partnership with the participating community of the National Flood Insurance Program (these commitments made by the participating community are outlined in 44 CFR 59.22(a)(9)). While FEMA has the addresses for National Flood Insurance policy holders, FEMA does not have the addresses of new properties that are being added to a Special Flood Hazard Area because of a flood map update. FEMA encourages participating communities to provide notifications to individual property owners, yet FEMA does not hold the necessary parcel information to perform that notification itself. Federal privacy law concerns keep FEMA from retaining property tax and parcel information that would be required to issue these notifications.

Lack of Funding for Local Hydrology Studies

3. It's my understanding that current law authorizes FEMA to provide up to $250,000 to a community for mapping support activities like hydrology studies, but that Congress has never provided any appropriations to the agency for this purpose.

- Can you please explain the current status of the law and the availability of funds?

Response: The question seems to point to two different funding mechanisms. FEMA does support communities leading or contributing to mapping studies, including engineering analysis and community outreach. This is done through FEMA's Cooperating Technical Partner (CTP) program. While cash match is encouraged in the CTP program, it is not required. In fact, as much as half of the funding (approximately $79M in FY10) is provided to State and local partners who do not make a cash-match to the grant. The decision to partner with FEMA in the development of a flood hazard mapping study is made at the beginning of the project.

In referencing $250,000 being made available: This refers to 42 USC 4104(f). This provision authorizes the reimbursement of certain expenses related to successful appeals, not to exceed $250,000. The provision applies only to appeals, as defined in 42 USC 4104(b). While this reimbursement is authorized, no Congressional Appropriation has been made that would allow reimbursements to be made to successful appellants.

- Could locals use this same program to finance levee inspections by a private engineering firm?

Response: No.

Scientific Resolution Panel

4. It's my understanding that the new panel will have the authority to settle disputes on base flood elevations (vertical data) but not flood zone boundaries (horizontal data).

- Why is that the case?

Response: Yes, you are correct; per the National Flood Insurance Act and regulations on appeals the Scientific Resolution Panel will settle disputes on base flood elevations and not flood zone boundaries. 42 USC 4104(b); 44 CFR 67.6. Specifically, the Panel will review appeals to the base flood elevations to determine whether an appellant's data is scientifically and technically superior to FEMA's data. If the appellant's data is found to be superior and changes the base flood elevation, the flood zone boundary will change appropriately to match that new flood elevation to the topographic data to establish the flood zone boundary.

V-Zones

5. Federal regulations dating back to the 1970s prohibit funding for new construction in coastal high-velocity zones known as V-Zones. Rebuilding in safe locations generally makes sense, but in Louisiana and other parts of the country, V-Zones extend dozens of miles inland, and this rule threatens to withhold federal funding from entire coastal corridors. Where there is severe vulnerability, stricter building standards should be applied to cover things like pilings, elevation requirements, and breakaway walls. FEMA has published a guide to Coastal Construction demonstrating the existence of safe building techniques to ensure building survivability. Outright prohibition of new construction is not an appropriate policy though for established communities with major port and energy infrastructure. FEMA has indicated that it plans to revise these outdated regulations.

- Have the new regulations been drafted, and if so, where are they in the review process?

Response: The rule is currently in the development stage.

Backlog of Mitigation Projects

6. The Pre-Disaster Mitigation fund provides grants to states, communities, and tribal governments to implement mitigation planning and projects. It's my understanding that despite the massive national need for risk reduction, $230 million in obligated balances had not been spent as of April 30th, an amount exceeding the annual budget of the entire program.

- Can you explain the reason for this backlog and the steps being taken to eliminate it?

Response: The Federal Emergency Management Agency's (FEMA) Pre-disaster Mitigation Grant Program (PDM) program is authorized by the Stafford Act, as amended by the Disaster Mitigation Act of 2000, P.L. 106-390, to provide grants for the implementation of cost-effective pre-disaster hazard mitigation activities. The PDM program provides technical assistance and Federal funding to State, local, and tribal governments to support the development and enhancement of hazard mitigation plans aimed at instituting policies, practices, and mitigation projects that involve physical measures to avoid or reduce damage from disasters. Funding these activities reduces injury, loss of life, and damage to property, including damage to critical facilities, and represents a significant opportunity to reduce the Nation's vulnerability to natural hazards while also reducing reliance on Federal disaster funds.

PDM project grants often involve complex construction activities taking three to five years to complete. FEMA awards funds to the State once at the beginning of the grant performance period even though activities will take months or years to complete. At the State level these grants operate on a reimbursement basis. Therefore, States do not provide funds to communities until the community requests reimbursement for work completed. This accounts for the funds obligated by FEMA that have yet to be spent.

FEMA succeeded in obligating over $500 million to States and Tribes from 2003-2009. FY10 pre-award activities are underway and obligations have begun. All remaining grant funds from previous years are entirely dedicated to projects identified for further review or set-aside for activities identified in the PDM Joint Explanatory Statements (JES).

Premium Rates & Grandfathering

7. GAO (GAO -10-63IT) has recommended that FEMA help ensure that premium rates are more reflective of flood risks and expressed criticism of "grandfathered" premium rates – FEMA's policy to allow certain properties remapped into riskier flood zones to keep their previous lower rate.

- Since these grandfathered rates do not reflect the actual risk of flooding to the properties and do not generate sufficient premiums to cover expected losses, how does FEMA expect to bridge this cost gap?

Response: In order to better assess the impact of grandfathering on NFIP rate levels and to further assure that grandfathered rates are actuarially sound, the NFIP has been collecting information on grandfathered policies beginning October, 2009.

However, FEMA disagrees with the characterization of grandfathered rates that GAO made in their report.

First, it is incorrect that FEMA allows certain properties remapped into riskier flood zones to keep their previous lower rates. These policyholders lose their eligibility for the low-cost Preferred Risk Policy (PRP) when they are remapped. They are allowed to continue to use X-Zone rates, but must move to the much more expensive X-Zone Standard rate. Our policyholders are fully aware of this increase in premium, and have brought this to the attention of their Senators and Representatives. FEMA has been in extensive dialogue with Congressional members in an effort to work out a solution to this perceived problem.

Second, while we agree that the premium many of our grandfathered policyholders pay is less than their premium would be if we would individually rate those policies, we disagree that the grandfathered class of policyholder as a group creates an additional subsidy to the Program. An explanation might be helpful: Instead of individually rating each policy, the NFIP uses what the rest of the insurance industry uses: class rating. FEMA attempts to set the rates X-Zone Standard policyholders (i.e., the grandfathered policyholders) at levels that reflect the average full risk for all policies in the class. So within the X-Zone Standard risk class, the "average" rate that is charged all policyholders is higher than the individual risk-rate for some policyholders and lower

than the individual risk-rate for other individuals. FEMA does acknowledge that the X-Zone Standard risk class contains a much broader range of risks than is common in the private industry. Given the above characteristics of our X-Zone Standard risk class, FEMA agreed with GAO's recommendation in its original report (GAO-09-12) that we should collect additional information about grandfathered policies. FEMA will use this information on grandfathered policies as an additional input to underwriting and pricing this class of risks.

Map Lifespans

8. GAO noted that some of the maps FEMA uses to set premium rates will remain out of date despite recent modernization efforts. For instance, FEMA's Director for Financial Markets and Community Investment, Orice Williams Brown said in his testimony to the House Financial Services Subcommittee on Housing and Community Opportunity, that these modernization efforts do not account for ongoing and planned development, thus making maps outdated shortly after their completion. He also stated that FEMA does not map for long-term erosion.

- Do you share these concerns that your maps will continue to be inaccurate despite modernization efforts?

Response: Maps modernized today use the latest technologies to estimate the current 100-year floodplain. Technology to estimate what the future 100-year flood might look like exists, but the uncertainty in those estimates can be large due to difficulties in predicting land use patterns and climate changes. FEMA does provide a venue for local governments to identify future flood hazards on their maps and provides incentives to do so; however, it does not have the authority to require floodplain management practices be employed in these areas.

As far as long-term erosion is concerned, FEMA has recognized since the mid-1970's that there are programmatic deficiencies with respect to the long-term erosion peril. Beginning in the late 1980's and continuing through the early 2000's, FEMA funded (and conducted in-house) a great deal of research regarding the administration of a long-term erosion mapping, management, and insurance program through the NFIP. These research efforts culminated in a Congressionally mandated report prepared for FEMA by the H. John Heinz Center in 2000. The Heinz Center report made two recommendations: (1) Congress should instruct FEMA to map coastal erosion hazard areas, and (2) Congress should require FEMA to include the cost of expected losses from long-term erosion when setting erosion rates. To this date, Congress has not acted on these recommendations. FEMA believes that a Congressional mandate would be required for the Agency to fully consider long-term erosion through the NFIP.

- How can the agency address these concerns?

Response: FEMA has partially addressed long-term erosion-based actuarial deficiencies by raising rates in our V Zones close to the maximum 10 percent allowed per year, most years since the Heinz Center report was released (these actions were undertaken under existing regulatory and statutory authorities). Admittedly, however, these actions only address the actuarial deficiencies of long-term erosion in aggregate, whereas detailed erosion mapping would be required for a more equitable site-specific solution. It is important to note that FEMA is currently in the process of conducting a national-scale study titled "The Impact of Climate

Change on the National Flood Insurance Program." This study considers all aspects of climate change, including changes in precipitation patterns, changes in frequency and intensity of coastal storms, and changes in sea level rise (and associated physical process such as long-term erosion).

- You indicated in your testimony that areas will be re-mapped every five years. Understanding that there are costs associated with more frequent revisions, do you believe the five-year interval is sufficient and appropriate?

Response: FEMA evaluates how the flood hazards may have change in five year intervals. If there is indication a change is likely, resources are applied to update the flood maps. The flood mapping process itself can take 2-3 years or longer depending on the complexity of the study and the implications of the changes, which essentially means the time between map updates can be closer to 8 years.

Post-Hearing Questions for the Record
Submitted to Ms. Knight
From Senator Mark Pryor

"Flood Preparedness and Mitigation: Map Modernization, Levee Inspections and Levee Repairs"
July 28, 2010

1. I've heard of repeated problems from my constituents regarding public outreach and communication. There is an abundance of confusion surrounding the flood map modernization process and how FEMA updates the maps.

    a. Can you walk me through the process beginning with how FEMA decides which counties will be remapped?

Response: FEMA follows these steps to update the flood insurance rate maps as part of flood insurance studies:

- Work with state agencies to identify areas most in need of study, noting areas of high risk, newly available or updated topographic data, newly developed areas, and other relevant criteria;
- Work with local officials to develop a scope of work for a given geography;
- Acquire, compile, and analyze available topographic data, risk data, and FEMA Library data
- Develop new or revised flood hazard data;
- Develop the Digital Flood Insurance Rate Map (DFIRM) and release the preliminary version to community officials and the public;
- Exercise a 90-day statutory appeals period, in which property owners can affect changes to the DFIRM by submitting scientific or technical data that demonstrates a more accurate base flood elevation; and
- Exercise a 6-month compliance period, where communities adopt the maps into local floodplain management ordinances

Upon completion of the above steps, new flood insurance rate maps become effective, at which point they can be used to identify structures which require flood insurance as part of the requirements of the National Flood Insurance Program (NFIP) (44 CFR)

    b. At what point do you engage with locally elected officials?

Response: FEMA engages locally elected officials at several points during flood mapping studies. Below is a description of how we engage local officials during the Map Modernization Program.

<u>Engagement of Local Officials Under Map Modernization</u>

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During Map Modernization flood mapping studies, local official engagement is defined primarily by the regulations noted within 44 CFR 66.5. These regulations require that a FEMA or other Federal employee consult and coordinate with communities during the study process in the following ways:

- Contact the state coordinating agency and officials of a community in which a proposed study is undertaken;
- Hold a scoping meeting with the community and state coordinating agency to discuss purpose,
  timeline, areas, and other details of the study;
- Ensure that local officials are informed of their current and future NFIP responsibilities, FEMA's administrative procedures, and the community's role in establishing elevations;
- Encourage local officials to disseminate the intent and nature of the study so that interested parties will bring relevant data to the community ;
- Request that the community submit pertinent data concerning flood hazards;
- Notify local officials of the progress (levels of interaction vary by community); and
- Inform the community if the study's timeline, purpose, areas involved, methods, or use of data is changed over the course of the study

Once the study is complete, FEMA sends a copy of the preliminary Flood Insurance Study (FIS) and the Flood Insurance Rate Map to the community and holds a meeting to notify local officials of the study findings and methodology and encourage local dissemination of surveys, studies, and investigations. If the Base Flood Elevation of the community is changed, FEMA:

- Publishes the proposed flood elevation determination for comment in the Federal Register ;
- Notifies the community CEO by mail of the proposed flood elevation determination ; and
- Publishes the proposed flood elevation determination in a prominent local newspaper at least twice during the 10 days following the CEO notification to start a 90-day appeal period

If the community appeals the proposed flood elevation determination, the community CEO must submit an appeal within 90 days of the second newspaper publication. The administrator reviews the CEO's decision to appeal and the community's supporting data. After the materials are reviewed, FEMA informs the community in writing of any modification to the community's final flood elevation and may notify them in person during a final meeting. FEMA:

- Sends a letter of final determination to the community CEO, all individual appellants, and the State Coordinating Agency;
- Makes publicly available the reports and other information used to make the final determination;
- Notifies local officials of the findings and the methods employed in reaching the conclusions;
- Encourages local dissemination of surveys, studies, and investigations; and
- Posts the letter of final determination and supporting documents in the Federal Register

c. How do you ensure that there is adequate public notification?

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Response:
Public Notification Under Map Modernization

During Map Modernization flood mapping studies, 44 CFR 67.4 requires that a FEMA or other Federal employee notify the public by encouraging local officials to disseminate the intent and nature of the study. If, once the study is complete, FEMA finds that the Base Flood Elevation of the community is changed, FEMA:

- Publishes the proposed flood elevation determination for comment in the Federal Register; and
- Publishes the proposed flood elevation determination in a prominent local newspaper at least twice to start a 90-day appeal period

If the community appeals the proposed flood elevation determination, FEMA reviews the supporting data and:

- Sends a letter of final determination to all individual appellants;
- Makes publicly available the reports and other information used to make the final determination;
- Encourages local officials to disseminate surveys, studies, and investigations to the public; and
- Posts the letter of final determination and supporting documents in the Federal Register

2. I think it would be helpful, if on FEMA's website, the agency posted a document that is an easy to follow step-by-step guide of what communities can expect during the process. Is this something that FEMA could do in the near future?

Response: We agree. Anything we can do to improve local official understanding of the process and set expectations, prior to and during a flood mapping or flood risk study, will encourage local partnerships and facilitate the process. We will begin work on an update to our website in the beginning of the new fiscal year.

Yes, FEMA recognizes the importance of outreach and communications to local officials and citizens. As Risk MAP launches (2010) the below approach will look to improve our risk communications.

Proposed Engagement of Local Officials Under Risk MAP

The engagement of local officials is critical to Risk MAP's success as the program enables communities to make informed decisions about risk. Risk MAP will seek to work side-by-side with local officials to not only identify, but also to assess, plan for, and communicate their communities' risks. Risk MAP's proposed comprehensive engagement strategy builds on lessons learned from Map Modernization outreach and best practices for community engagement. Our proposed plan for the engagement of local officials, as well as tools and templates that are being developed to support this plan, is provided below.

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Engage communities early and often. Communities undergoing a study that are aware of Risk MAP study progress will be more likely to feel like a partner in the effort, be comfortable with the project progress, and communicate accurately about it to constituents, Congress, and the media. To inform communities of impending Risk MAP projects as soon as possible and keep them apprised of the project's status, Risk MAP proposes:

- Outreach directly to each community within a study as soon as they have been sequenced and on multiple occasions leading up to the start of the study;
- A minimum of four meetings held with the communities instead of the two to three meetings held during Map Modernization studies; and
- Monthly status reports that provide quick updates on project status, accomplishments to date, current activities, and next steps.

Agree upon and document project outcomes and responsibilities. Turnover at the community level and the length of studies have led to unclear expectations and unintended surprises in the past. To set and document clear project objectives at the beginning of each project, Risk MAP proposes the creation of a Project Charter for each community. The Project Charter is intended to provide details about the project's objective, the final flood risk, assessment, and regulatory products FEMA will deliver, the type and amount of planning support provided, and the community's responsibility in terms of outreach to its constituents.

Provide media outreach and community outreach assistance. Proactive media outreach is important to the success of Risk MAP studies, as local media are able to quickly provide information across a community from a trusted source. In addition to the communications required by the National Flood Insurance Act and implementing regulations, such as the Federal Register notices and newspaper listings, Risk MAP proposes providing communities with easy to use media kits and customizable advertisements to allow them to quickly and accurately provide media with information about the project at three key times: 1) project initiation, after the Project Charter has been developed; 2) when the preliminary maps are released; and 3) when the maps are adopted by the community. FEMA proposes providing local officials who have little or no media outreach experience with risk communicators training so they can accurately and consistently convey project and risk information that resonates with constituents. FEMA also proposes working with local officials to create a customized community outreach plan to motivate and guide local official outreach to their citizens about their risks and steps to mitigate them.

3. It's my understanding that the only thing a community can appeal during the map modernization process is the base flood elevation (BFE).

    a. Why aren't all mapped communities given determined BFEs and what criteria are used to choose which communities are given a BFE?

Response: Floodplains without published BFEs (or approximate A zones) have traditionally been used in situations where the data used to identify the flood hazard was not based on a hydraulic model. Rather, the hazard was estimated using hydric soils maps, normal depth calculations, or some other engineering calculation which was not based on a hydraulic model.

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Many of these Zone A boundaries were re-delineated under map modernization or in some cases ported over into a digital format. Going forward, FEMA has committed to calculating the 100 year flood elevation for all new floodplain analyses under Risk MAP. Though FEMA may not require communities to adopt these elevations as a component of the official flood hazard map in all cases, the information will be available for local officials for floodplain management decisions.

b. What is the recourse for communities who do not have determined base flood elevations but are dissatisfied with the zone in which they are depicted on the flood maps?

Response: Communities can provide better data and FEMA will evaluate it during the post-preliminary process. Their recourse is very similar to appellants. Communities can also pursue a Letter of Map Revision that formally changes the flood map based on engineering information that can support the depiction of a Base Flood Elevation provided by the community.

c. Why does FEMA not allow a community to appeal other aspects of the new maps, such as the Zone determination?

Response: By statute, the only thing appealable is the BFE; however, FEMA considers all information presented and will revise zone determinations and other information depicted on the maps accordingly. This includes floodplain boundaries, corporate limits, road names and other features.

4. If I understand correctly, a Letter of Map Revision is the method by which a community can request to have their flood map revised once it's become final – so this would be after the appeals process has expired and after a map has been implemented.

Response: Correct. Anyone can request a map change at any time.

a. Can you tell me about that process?

Response: A Letter of Map Revision (LOMR) is a letter from FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodways or flood elevations. (44 CFR Ch.1, parts 60,65,72). In this process, the applicant provides the data needed to support the change, works through the community (when applicable) to ensure appropriate local/state permits have been obtained and other procedures are followed, then sends the request to FEMA, which reviews and processes the change.

b. Is there a neutral party to evaluate Letters of Map Revisions?

Response: FEMA hires qualified engineering firms to review the requests and prepare packages which are then reviewed by FEMA staff and eventually finalized as Letters of Map Change.

c. When communities submit letters of map revisions to FEMA, how often are they successful?

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Response: Most of the requests ultimately result in a map change as the requirements are generally well understood and only those who have met them apply. However, on occasion, there are cases where changes or map amendments are denied, the applicant withdrawals their request, or the applicant simply does not complete the process and the case is dropped.

d. Does a community have to have a determined base flood elevation in order to submit a letter of map revision? If so, what is the recourse for communities who do not have determined base flood elevations but would like to change the zone in which they are depicted on the flood maps?

Response: It is required for LOMR applicants to provide scientific and technical documentation, including hydrologic and hydraulic data to support the requests. The same requirements apply to Zone A areas where the BFEs are not shown on the map.

5. I displayed at the hearing a copy of the flood map for a portion of Crittenden County from 1981 the flood map from this year. There is a significant increase in the Shaded Zone X area. It looks to me like the maps go from having no area depicted as Shaded Zone X in 1981 to being almost entirely zoned as Shaded Zone X.
   a. What has changed so drastically to result in such a significant increase in Shaded Zone X area?

Response: The increase in shaded zone X in Crittenden is mostly defined as "area protected by levee". Within this area there are no federal requirements for flood insurance and no local floodplain management requirements. It is FEMA policy to identify areas behind levees that meet regulatory requirements as "protected" so those living in those areas are aware that flooding is possible. Its important to note that just 2 months prior to the hearing, Crittenden County flooded and FEMA paid 40 claims – all of which were in the newly proposed shaded zone X.

b. Can you describe the factors that were considered by FEMA that led to the map of Crittenden County going from what it looked like in 1981 to what it looks like now?

Response: Principally, the regulations promulgated in 1986 that include 44 CFR 65.10 affected the shift to Shade Zone X on the 2010 proposed maps. The maps presented to the community in 1981 were developed under different standards. 44 CFR 65.10 requires FEMA to "only recognize in its flood hazard and risk mapping effort those levee systems that meet, and continue to meet, minimum design, operation, and maintenance standards that are consistent with the level of protection sought through the comprehensive flood plain management criteria established by §60.3 of this subchapter.

c. Are the factors that you used in making this determination universally applied to all modernized flood maps?

Response: Yes.

6. Has FEMA reached out to banks and lenders to see if those institutions will begin to require insurance for Shaded Zone X properties?

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Response: FEMA has worked closely with the Federal lending regulatory agencies, Federal agency lenders, and Government Sponsored Enterprises since enactment of the Flood Disaster Protection Act of 1973. These agencies and organizations rely on Federal statutes when developing regulations for lending institutions. All lenders retain the right to require insurance as a condition of any loan. Smaller local lenders who cannot easily spread their financial risk may require flood insurance coverage in areas protected by levees, or more generally to all shaded Zone X areas, however, FEMA has not seen a broad systemic shift of lending practices in this direction.

7. Where would it be helpful for FEMA to have more flexibility within the statute to address the concerns of communities going through the map modernization process?

Response: FEMA has undertaken a policy analysis initiative for National Flood Insurance Program (NFIP) Reform. The NFIP Reform team is looking at many issues in the current program.

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Post-Hearing Questions for the Record
Submitted to the Honorable Mehlhoff
From Senator Mark Pryor

"Flood Preparedness and Mitigation: Map Modernization, Levee Inspections and Levee Repairs"
July 28, 2010

1. You mentioned in your testimony that your local communities cannot afford to hire private engineering firms to certify levees. I think this illustrates a problem many communities face with various aspects of the flood mapping process. Whether it is certifying a levee or appealing a flood mapping decision, communities often lack the financial resources and technical expertise appeal decisions to FEMA.

    a. How have your communities tried to address these obstacles?

    Answer: We submitted a request for technical assistance to the Omaha District U.S. Army Corps of Engineers. (Dated July 24, 2009) This request was for technical assistance from the Corps regarding this flood protection project as it relates to the FEMA flood map modernization program. (We can submit a copy of the letter if you request it) We have also talked to City of Great Falls and Cascade County officials but none have the needed expertise. We have finally enlisted the help of a local engineering firm who has been associated with this levee for a number of years.
    We have just received a bid of $15,000 to put information together that will help us submit future bids to complete the "Certification Process". We also hope to get a better idea of the cost of the "Certification Process" from this study. I am now trying to get a (DNRC) Montana State Dept. of Natural Resource and Conservation Grant to help defray this cost. We still have no idea where we are going to get future money to complete the FEMA "Certification Process".

    b. Do any of you have suggestions on how communities can leverage technical expertise in order to effectively advocate for themselves before the Federal government?

    Answer: We need the Army Corps to provide this technical assistance because they have the documents and expertise to aid us in this process. We are still not sure any local engineering firm will be willing or able to take on the final work to gain certification because they still have questions on liability and scope of work needed.

2. One thing I have experienced firsthand, and something that I've heard repeatedly from states and localities is that there is a lack of information and a good deal of misinformation between the Federal agencies and state and local stakeholders.

    a. As an elected official, what was your experience with receiving information from FEMA and the Corps and then communicating that information to your constituents and working to address problems?

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Answer: I have been working with our local levee district board and have attended three FEMA meetings and a number of conference calls with the Corps and FEMA. We also had the Secretary of Homeland Security visit our levee in Great Falls. Disseminating information has not been a problem. FEMA and the Corps have been good in moving information from one stakeholder to another.
It appears that FEMA and the Corps are not working with each other to help solve the certification problem in our area. The problem is we still are unsure of the cost of certification because we are unsure of how much past data can be applied. The less data that FEMA will accept from Corps data the more we will have to pay to get that information.

b. What is your assessment of FEMA's outreach to communities to communicate the purpose and implications of the flood mapping process?

Answer: They have been to our area three times. We understand their position. It is just difficult for us to implement the certification requirements that they request. When I testified, FEMA and the CORPS seemed out of touch about the hardships that could result for either signing or not signing the PAL agreement. We have now had movement since the Sec. of Homeland Security Janet Napolitano's visit to the Levee in Great Falls. FEMA now seems willing to revise the PAL to put less liability on our local area. This is a good change to help find a temporary solution to our problem. We still face problems of cost of implementation of the PAL agreement, possible liability for levee infrastructure improvements if needed, and taking over the responsibility for certification that has traditionally been a responsibility of the Corps of Engineers. We see FEMA willingness to change the original PAL agreement to make it more acceptable to us as a flood district and to our local city and county government as a positive step. All three must sign off on any PAL agreement so an acceptable PAL is a very essential component toward final resolution of our problem. FEMA has provided only limited information on flood mapping appeal and protest procedure. Although this is not an issue yet, and we hope it will never be, it may be something we may need in the future. We hope FEMA willingness to compromise will continue. This would help bring down the cost , lead to both sides getting what they need from an agreement, and make an appeal process unnecessary.

c. Have any of you found issues with FEMA and the Corps reaching out to state officials and not local officials or vice versa?

Answer: In Montana the Dept. of Natural Resources and Conservation (DNRC) has signed an agreement with FEMA to be their representative in this process. This has caused a problem because we need DNRC to be our advocate and they have a conflict of interest on this issue. DNRC may not have agreed to represent FEMA in this matter if they would have realized the complex problems that this process has caused. I would say that at the beginning of the process two years ago we had nobody talking to anybody. That situation has improved, because Senator Testers office in Great Falls, the local levee board's work, and I took leadership role to bring all groups together. We have also united various agencies from State Government to help. We now have a good working group from our levee board, local and state government, and our federal delegation. The Corps

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still seems to not want to play an active roll to defend their work on levee construction and follow up maintenance supervision to FEMA.

3. What are your final recommendations for the Corps, FEMA and Congress to address any overarching issues you face or have identified in order to improve the flood mapping process?

What is the solution to this problem?

1. Answer: The Corps of Engineers needs again to take over responsibility for levee certification. The Corps has data all the way back to the construction of the two levees in Cascade County plus data from annual (every year) and periodic (every five year) inspections to use.

2. When Corps Annual and Periodic inspections are made, the data required of the engineering firms doing the inspections needs to be correlated to FEMA's needs for certification. That would result in a great cost savings to the tax payer.

3. The local levee district elected officials need to be given back their original responsibility of overseeing levee maintenance only.

4. The Corps of Engineers should do a risk assessment on all Corps sponsored levees and FEMA should exempt levee systems that the Corps deems to be of low risk.

5. If number 4 is not possible, FEMA needs to put different certification criteria on different risk classes of levees to make the cost of certification match the risk. This would be better than the one shoe fits all approach being used now. The City of Great Falls and Cascade County maps are dated February 15, 2002. This map date is out of the ten year window but because of the limited change in our area our maps are probably more relevant than other area maps that are 5 to 10 years old. Yet the one shoe fits all approach makes them not useable or of limited value.

6. FEMA-CORPS coordination during the MAP Modernization process should be mandatory when Federal Flood Protection Projects (levees) are already recognized by FEMA on the flood maps.

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Post-Hearing Questions for the Record
Submitted to Dr. Maidment
From Senator Mary Landrieu

"Flood Preparedness and Mitigation: Map Modernization, Levee Inspections and Levee Repairs"
July 28, 2010

Recommendations for the Map Arbitration Panel
1. You participated in the National Research Council's Committee on FEMA Flood Maps, which produced a report on improving flood map accuracy. One of the major conclusions of the 2009 report, *Mapping the Zone*, was that topographic data has the greatest effect on the accuracy of Base Flood Elevations (BFEs). FEMA's new Scientific Resolution Panel is designed to review and resolve conflicting data related to proposed BFEs.

- Given your experience with BFEs, please share with us any specific recommendations you may have for the Scientific Resolution Panel.

Response from Dr Maidment
The *Mapping the Zone* report includes an analysis of the statistical uncertainty in long term records of extreme flood elevations measured by the USGS at stream gaging sites, which concludes that the sampling uncertainty in such elevations is approximately one foot. Since flood mapping and modeling methods cannot be more accurate than long term measurements, it follows that if two estimates of the Base Flood Elevation developed by mapping and modeling methods differ by less than one foot from one another, they should be considered statistically indistinguishable. The Scientific Resolution Panel may wish to consider this study as establishing a baseline value as to what differences in BFE's are statistically significant.

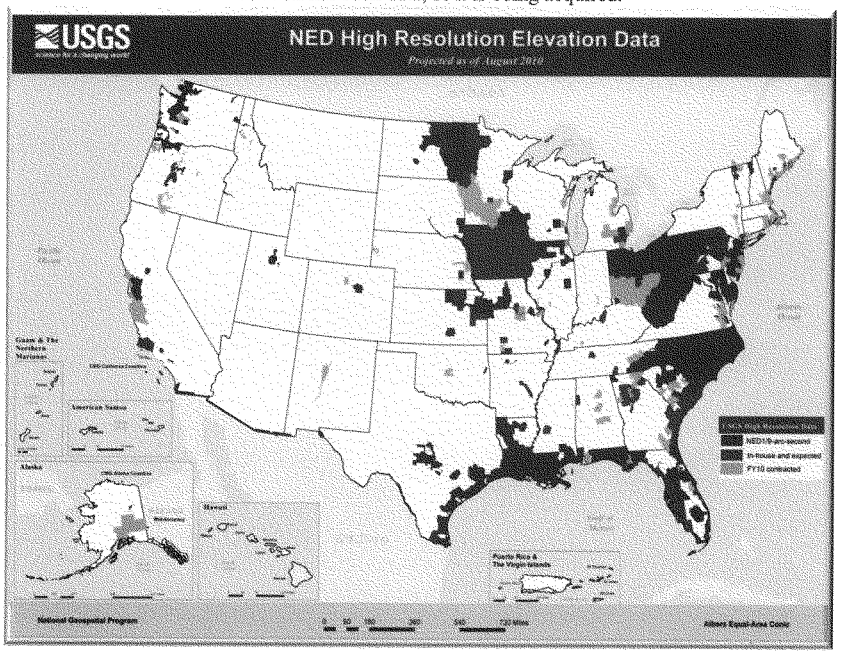
LIDAR
2. You mentioned in your testimony that there is a great disparity between the data acquired by LIDAR and the data derived from the National Elevation Dataset, which you say is "too old and inaccurate to support Flood Map Modernization." LIDAR (light detection and ranging) is similar to radar, but instead of radio waves it uses infrared laser pulses and is significantly more expensive.

- How do the benefits resulting from LIDAR data outweigh the costs?
- Do you believe FEMA is making satisfactory progress toward collecting this data, and what could be done to accelerate the process?

Response from Dr Maidment concerning LIDAR benefits and costs
In the *Mapping the Zone* report, a comprehensive benefit-cost analysis of flood mapping alternatives was carried out for three regions of North Carolina that included the cost of LIDAR data collection for those areas. This analysis showed that the greatest benefits of more accurate flood maps are avoided flood losses to planned new buildings and avoided repairs to infrastructure through more accurate base flood elevations and depiction of floodplain boundaries. Producing a more accurate base flood elevation using LIDAR data yields the greatest

increment of benefits because it enables insurance premiums and building restrictions to be set commensurate with a more realistic profile of the horizontal and vertical extent of flooding.

Response from Dr Maidment concerning LIDAR data collection
The map below provided by the USGS shows the coverage as of August 2010 of the nation with High Resolution Elevation Data derived from LIDAR or equivalent terrain measurement methods. About 20% of the nation has such data, or it is being acquired.



On August 9, 2010, FEMA delivered to Congress a report "Risk Mapping, Assessment and Planning (Risk MAP): National Digital Elevation Acquisition and Utilization Plan for Floodplain Mapping", which states that "FEMA is planning to invest about $20 million annually of the funding allocated in [collecting] elevation data", and this will result in "updated elevation data for about 26% of the contiguous United States". This means that combining the current coverage and what FEMA is proposing, more than half of the nation will still not have updated elevation, and that a more aggressive LIDAR data collection program is needed. The US Geological Survey has proposed a program for Enhanced Elevation Data that I believe should be strongly supported.

Post-Hearing Questions for the Record
Submitted to Dr. Maidment
From Senator Mark Pryor

"Flood Preparedness and Mitigation: Map Modernization, Levee Inspections and Levee Repairs"
July 28, 2010

1. Can you elaborate on how the scientific analysis/data used to determine FEMA's flood mapping zones compare to the data and analysis used to determine a base flood elevation?

Response from Dr Maidment

The Base Flood Elevation (BFE) is the flood water surface elevation that has a 1% chance of being equaled or exceeded in any year. The corresponding flood mapping zone defines the horizontal extent of flooding with water at this elevation. When the Base Flood Elevation has been determined with accurate terrain data and precise flood modeling, the elevation is considered accurate and the flood mapping zone is defined as AE. Maps with zone AE defined on them contain contours of the Base Flood Elevation that can be used for regulatory purposes by local authorities, who typically require the first floor elevations of buildings to be at or above the Base Flood Elevation. When the Base Flood Elevation has been determined with approximate terrain data and flood modeling, the elevation is considered approximate, the flood mapping zone is define as A, and no Base Flood Elevation contours are shown on the flood map. These maps can be used for flood insurance purposes but are less useful for local floodplain regulation.

2. Can you provide greater detail on the challenges of accurately determining of base flood elevation levels and the technology used to improve accuracy?

Response from Dr Maidment

There are three challenges to determining the base flood elevation: how large is the flood flow? How deep is the flood water? How high is the land surface elevation? The National Academies *Mapping the Zone* study showed that of these three factors, variations in the first two can affect the base flood elevation by one or two feet, but variations in the third factor, the accuracy of the land surface elevation data, could affect the base flood elevation by ten feet or more. High accuracy elevation data are needed to reduce the uncertainty in the land surface elevation data. I am attaching a map provided by the USGS showing the present coverage of high accuracy elevation data. About 20% of the nation is covered, but unfortunately, Arkansas has very limited coverage. The

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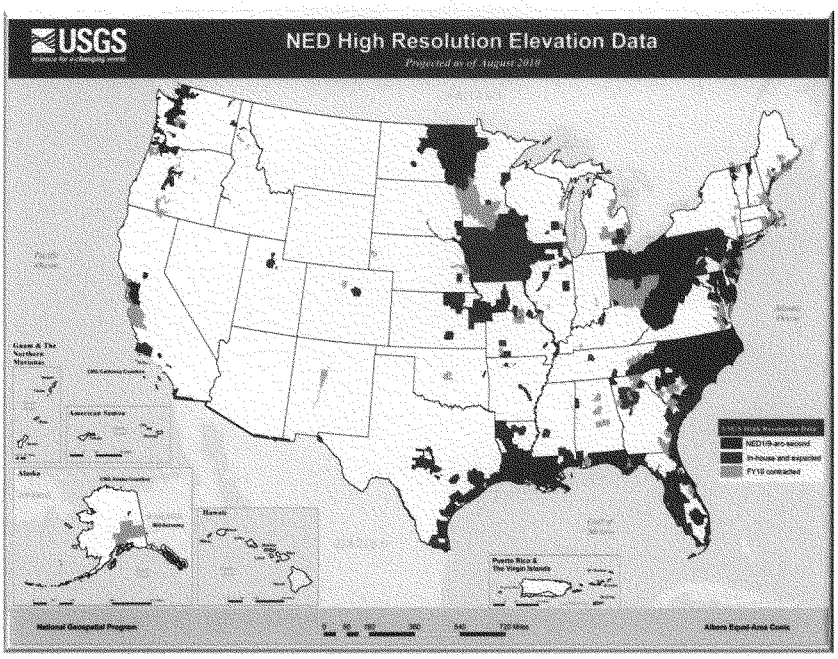
LIDAR (LIght Detecting And Ranging) method has become the technology of choice for collecting such data.



3. What are your final recommendations for the Corps, FEMA and Congress to address any overarching issues you face or have identified in order to improve the flood mapping process?

Response from Dr Maidment

The current process of national investment for flood risk assessment focuses on populated urban counties and leaves small communities in rural areas without updated flood maps or the financial means to acquire them. A mechanism for assessment of flood risk that treats citizens of the United States equally no matter where they live, is needed.

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Post-Hearing Questions for the Record
Submitted to Sam Riley Medlock
From Senator Mary Landrieu

"Flood Preparedness and Mitigation: Map Modernization, Levee Inspections and Levee Repairs"
July 28, 2010

Group Insurance Policies

1. The Association of State Floodplain Managers has written favorably about the possibility of group insurance policies for people living behind levees and community-based insurance policies rather than individual household policies.

- Would you please explain this proposal and the potential benefits of group policies to the committee?

Community based flood insurance policies and group flood insurance for structures behind levees are two promising proposals for improving the functioning of the NFIP. Neither proposal has been fully developed, but both appear to ASFPM to have important potential to 1) insure all properties in Standard Flood Hazard Areas (SFHAs), not just those with federally backed mortgages, 2) include incentives for community or levee district actions to reduce risk, and 3) provide insurance at less overall cost to individuals while expanding the policyholder base of the NFIP.

First, it is important to understand the changing nature of flood hazards and the role of insurance in managing risk. Between 1970 and 2004, storms and floods were responsible for more than 90 percent of the total economic costs of extreme weather related events worldwide. Hurricane Katrina and associated levee failures resulted in insured losses to the private sector of an estimated at $48 billion, with an additional $17 billion dollars from the National Flood Insurance Program (NFIP). Of the 25 most costly insured catastrophes that occurred in the world since 1970, 16 of these occurred here in the United States. Several elements explain this increase in the costs of disasters in recent years. They include urbanization and continued migration of the population closer to coasts and rivers, an increase in the value of assets at risk, and the increased frequency and severity of tropical storms and increased intensity of inland rainfall events resulting in severe flooding.

In its purest form, insurance has served as the primary mechanism for spreading risk of economic losses due to adverse events. However, the NFIP operates differently from the traditional insurance model in at least four important ways:

1. Adverse Selection. Flood damages are generally confined to certain areas and only property owners who perceive and act upon their risk would demand flood insurance, resulting in significant adverse selection, so actuarial premiums for that small group

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becomes a real issue. Moreover, the NFIP lacks the authority available to traditional insurers to decline providing coverage to property owners at all.

2. Subsidized Premiums. The NFIP provides reduced premiums for properties that predate hazard mapping and in many other cases. Moreover, the NFIP lacks the authority available to traditional insurers to increase premiums to cover losses. All of this undercuts its financial stability.
3. Lack of Incentives for Mitigation. Unlike traditional insurance, the NFIP is not designed to recognize different construction methods or reward property owner actions to reduce losses, other than elevation. But it does have to pay claims, creating a disincentive for property owners to undertake mitigation.
4. Mandatory Only for Federally-Backed Mortgages. The NFIP mandatory purchase requirement applies only to properties subject to a federally-backed mortgage, resulting in a reduced policy base to spread the risk and uneven coverage in a given special flood hazard areas; some properties are covered, others that have no mortgage are not.

FEMA Administrator Craig Fugate has launched a comprehensive review of the NFIP with recommendations for legislative and policy reform anticipated in the next one to two years. It is our understanding that making group policies available for areas behind levees and for entire communities are among the proposals being considered.

Flood insurance is currently only sold to the owner or tenant of a structure. Those policy holders do not have the ability to reduce the overall area flood risk to existing, or more importantly, to new development in their community. Those decisions are made by the community officials, who focus primarily on the taxes new development can generate, regardless of whether that property may be flooded in the future. Local officials also have 40 years of experiencing few consequences when it does flood, since the federal disaster funds cover some individual losses, but even more so for the public infrastructure that supports the at-risk development. To be effective, any community flood insurance policy would need to be priced to reflect accurately the current flood risk in the community. If the community allowed or avoided more at-risk development, the flood insurance premium would increase or decrease---thus those who make the decision to increase or decrease risk would immediately see the consequences of those decisions reflected in the flood insurance premiums for the community.

Group flood insurance policies that attach to the insured property can offer important advantages:

1. The group policy can be obtained by either the community or the levee owner and attach to each property in the covered area - regardless of whether the property is mortgaged - community-wide or in the area behind a levee that would be subject to flooding when the levee is overtopped or fails.
2. Premiums could be included as part of property owners' property tax or levee fees, which could be spread over the course of each year, lessening the financial burden of an annual payment.
3. Policies would transfer with the property, eliminating the possibility that a subsequent buyer would drop the coverage.

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4. Policyholders would have an economic interest in the community's flood risk management practices; the more resilient the community, the lower the insurer's exposure, resulting in more favorable premiums. In the case of leveed areas, policy holders would have a direct economic stake in the maintenance of their levee, since the more reliable the levee, the lower the premiums.

Academic researchers and policy experts continue to explore options for group flood insurance, as the idea gains popularity among risk managers and levee owners alike.

Flood Insurance Vouchers for Low-Income Households

2. The Association of State Floodplain Managers has also pitched the idea of creating a flood insurance voucher program administered by HUD to subsidize premiums for low-income households.

- Please explain this proposal in greater detail.

Affordability of flood insurance, particularly for lower income households, has been a concern for some time. The problem has been highlighted by recent accreditation issues with many levees and issuance of updated flood maps that show some areas newly mapped as flood prone. ASFPM and risk managers recognize that for very low-income families and struggling businesses, flood insurance premiums may be prohibitively expensive despite the fact that those on the margin are the least financially prepared to recover from a flood disaster. To help those families and businesses understand and manage their flood risk, we recommend that they continue to be required to carry flood insurance at a rate that accurately reflects their risk, preserving the message that they are living at risk of flooding, but that a flood insurance voucher program for lower income households be originated in the Department of Housing and Urban Development (HUD), as the agency most experienced in managing means-tested programs.

Voucher or similar measures to help lower income persons pay for flood insurance could have number of advantages. It would facilitate better compliance with mandatory insurance purchase (and retention) requirements, would ensure that those least able to recover financially from a disaster have insurance rather than relying on limited disaster relief funds, and would potentially spare the federal government significant pay-outs of disaster relief.

Since this would be a new authorized expense, it may be wise to initiate a study of the cost-effectiveness and other benefits to the taxpayer of providing direct assistance for the purchase of insurance as opposed to relying solely on disaster assistance after a flood occurs. Such a study should include the benefits of restoring households, businesses, and related economic vitality in a shorter time period due to insurance payments that better cover the cost of losses and reconstruction. Ultimately, such a program will likely be revenue neutral or result in savings to the Treasury by reducing disaster payouts.

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Building State Capacity

3. The Association of State Floodplain Managers indicated that "the National Flood Insurance Program must build State floodplain management capability and capacity or it will not succeed."

- Please explain how you believe FEMA or the program should go about this task and provide some examples of actions it should consider.

Many communities lack professional staff to develop community plans or review development applications to help ensure the safety of new development. This is particularly true of communities that are small, rural, economically disadvantaged, or a combination of these. The Community Assistance Program – State Support Services Element (CAP-SSSE) program derives its authority from the National Flood Insurance Act of 1968, as amended, the Flood Disaster Protection Act of 1973, and from 44 CFR Parts 59 and 60. This program provides FEMA the opportunity to partner with States to assist the 21,000 communities in the NFIP, a number too large for FEMA staff to assist, monitor, or train effectively. The program authorizes FEMA to cost share funding to States to provide technical assistance to communities in the National Flood Insurance Program (NFIP) and to evaluate community performance in implementing NFIP floodplain management activities. In this way, CAP-SSSE helps to:

- Ensure that the flood loss reduction goals of the NFIP are met,
- Build State and community floodplain management expertise and capability, and
- Leverage State knowledge and expertise in working with their communities.

States that have robust programs in place to help communities identify and manage flood risk fare better in flood events due to the advanced planning, training, and expertise in place prior to the flood. Despite the documented successes of the existing CAP-SSSE program, the limited funding means that most States are not able to meet the needs of their communities for effective flood risk communication, education, and technical assistance. Additional funding is needed to meet the following objectives:

1. Each flood-prone community in the State should receive frequent community assistance visits to ensure development accounts for flood risk, receive training in managing flood risk, update risk management and land use plans, and to make any needed revisions to community ordinances or practices.
2. Communities also need access to regulatory and other legal assistance to help identify and manage potential community liability associated with land use and permitting decisions.
3. State agencies can play a key role for their communities if they are able to house data to support risk mapping and to provide community assistance in the areas of information technology systems and topographical data development, as well as other key areas of mapping. States need to compile and share with federal and community partners data relating to flood risk, including the locations of levees, dams, and other structures. States need support to achieve an effective level of horizontal coordination across agencies, and vertical coordination among the federal, state, regional, and local risk managers.
4. FEMA has the same number of staff trying to deal with 21,000 communities today that they had years ago to deal with 6,000 communities in the NFIP. Additionally,

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development in high flood hazard areas of the coast and rivers is increasing as more and more people want to live there. It is not likely FEMA will obtain the staff needed to adequately assist 21,000 communities reduce and manage flood risk. The unified program among federal, state, and local governments will only succeed if State capability is increased to fill this gap. In the long run, this will be less expensive for the federal taxpayer than disaster costs for unwise development that will otherwise occur.

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Post-Hearing Questions for the Record
Submitted to Ms. Medlock
From Senator Mark Pryor

"Flood Preparedness and Mitigation: Map Modernization, Levee Inspections and Levee Repairs"
July 28, 2010

1. **My understanding is the State Association of Floodplain Managers has advocated for a variety of flood mitigation and preparedness activities intended to reduce risk. Will you walk me through some of the various activities your association has advocated for communities?**

The Association of State Floodplain Managers (ASFPM) provides professional guidance, training, and support for community officials and staff working to identify, manage, and reduce the risk of loss of life and property due to floods. Spanning more than three decades, our history and experience have identified three key areas for which technical assistance and guidance is most needed by communities across the nation:

1. Flood hazard identification and communication to recognize risk;
2. Development planning, processes, and practices to manage existing risk and reduce future risk; and
3. Legal guidance to manage community liability and ensure equity and defensibility of community standards, practices, and actions.

In each of these key areas, ASFPM encourages community initiatives and leadership to help reduce flood losses, as discussed below. Although this response seeks to walk you through these various activities, we would be happy to meet to discuss these activities in more detail, or to answer any further questions.

1. Flood Hazard Identification & Communication.

Effective management of floodplains and flood risk depends on accurate floodplain mapping and related flood hazard data. A floodplain map's accuracy depends on the data behind it and the resources put into it. Local communities, states and the private sector need accurate detailed maps to guide development, prepare plans for community economic growth and infrastructure, protect the natural and beneficial function of floodplains, and manage private and public investments.

ASFPM administers the Certified Floodplain Manager (CFM) program to ensure that floodplain management staffs throughout the nation are trained, knowledgeable, and up-to-date on the latest hazard identification and risk management innovations, The CFM Program includes among its required skills the ability to read and interpret a FEMA Flood Insurance Study and Flood Insurance Rate Map. Only those applicants who pass a rigorous exam are eligible to become Certified Floodplain Managers. Some States, such as Arkansas leverage the ASFPM CFM

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program to build community capacity. In addition to its administration of the CFM Program, ASFPM produces numerous newsletters, studies, white papers, and guidance to support local floodplain and flood risk management activities, including many that relate to mapping and outreach.

Communities are encouraged to participate as a full partner with FEMA throughout the mapping or remapping process. Each community is encouraged to compile and provide to FEMA as much mapping data as possible, including topography, drainage, and other base layers; high-water marks and other data from past flood events; and areas of known risk or important features, such as erosion hazards, ice jams, subsidence areas, critical habitat areas, wetlands, groundwater recharge zones, and any other areas that may have been misrepresented on previous maps. Additionally, it is important that communities indicate where new development is planned to occur so accurate flood maps can guide that development to be safer when flooding occurs. As preliminary maps are made available, communities need to conduct comprehensive public engagement to raise awareness, notify potentially impacted property owners, and resolve possible mapping problems. As maps become final, communities need to update their management plans for land use, hazards, climate change, and resource identification, and consider use of future conditions hydrology and adoption of higher standards that stabilize and reduce flood risk.

Through various and multiple media, communities are encouraged to engage and educate their constituents on the flood risks present in the community and how they affect property owners, as well as specific issues, such as evacuation plans and roadways that can flood in high water. Many communities conduct annual festivals raising awareness of their water features to engage the community in the health and safety aspects of their waterways. These events present important opportunities to share national messages on the importance of flood insurance (NFIP's FloodSmart.gov) to protect property owners largest investment, avoiding flooded roadways (National Weather Service's "Turn Around, Don't Drown"), and promoting acquisition and use of NOAA Hazard Radios. Additional community activities include periodic PSAs, utility bill inserts, presentations to community groups, signage posted at locations of key natural features or hazards, and most importantly, maintaining publicly-accessible maps and hazard information in the community library and on the community's website.

2. Development Planning, Processes, and Practices to Manage Existing Risk and Reduce Future Risk.

Community planning encompasses a variety of activities to identify and manage existing hazards and risks, and to direct future development and public investment from flood-prone areas. Communities are encouraged to develop and adopt plans, standards, and permitting practices that take hazards into account, and that actively engage potentially affected property owners, developers, adjacent communities, and other important stakeholders throughout the planning process.

Communities are encouraged to ensure that every plan or ordinance that guides new development reflects and incorporate natural hazards. Land use plans and zoning ordinances have the potential to reduce flood damages or limit damage-prone development in hazardous or

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sensitive areas. ASFPM developed the No Adverse Impact, or NAI, approach that provides for consideration of anticipated impacts of proposed development on adjacent, upstream, and downstream property owners. NAI's legal foundations are grounded in ancient legal doctrine of property owners refraining from activities that would harm other property owners. As part of its NAI effort, ASFPM recommends that communities adopt standards that stabilize and reduce flood risk.

3. Legal guidance to manage community liability and ensure equity and defensibility of community standards, practices, and actions.

It is increasingly important for community leaders to have access to legal guidance to minimize liability and ensure that adopted standards are equitable, legally defensible and consistently enforced. ASFPM has developed legal guidance for states and local officials to assist them in the process of evaluating whether proposed regulatory or administrative actions may result in an unconstitutional taking of private property or raise substantive due process concerns.

Where state agencies or local governments exercise regulatory authority affecting the use of private property, they must be sensitive to the constitutional limits on their authority to regulate private property rights. Failure to consider these constitutional limits may result in regulatory activity that has the effect of appropriating private property even though that outcome may not have been intended. Courts, however, have nearly uniformly upheld public safety regulations where those regulations are adopted and enforced to prevent harm or adverse impacts on public health, safety, and welfare.

2. How would you suggest that FEMA work with communities throughout the flood map modernization process to make some improvements to the implementation of the program?

ASFPM supports and continues to monitor the new mapping program, RiskMAP, which we believe will involve significantly enhanced relationships with communities during the process of updating of flood maps. The Risk MAP process is intended to not only produce better flood maps and better engage the community and public, but to show the community how those maps can be used to identify, and to mitigate their flood risks.

Generally, FEMA's efforts to modernize the maps of the nation's areas of flood risk have resulted in getting the maps on a digital platform, which greatly improves the efficiency of updating those maps as watershed development occurs. More communities than ever have an improved sense of where and how they can most safely grow. However, challenges remain in four key areas:

- Community participation in the mapping process;
- New engineering studies that account for community and watershed changes;
- Acceptability of new maps because of community participation and ownership; and
- Helping the community integrate the new maps with community plans for development, mitigation and future growth.

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ASFPM views RiskMAP as a very promising means of addressing these challenges, and suggests that it incorporate enhanced technical assistance resources to support improved community participation in the mapping process, leading to more successful outcomes.

3. What are your final recommendations for the Corps, FEMA, and Congress to address any overarching issues you face or have identified in order to improve the flood mapping process?

Community outreach
There have been important gaps in communication about map modernization at the community level and in leveraging available data from local and regional entities. Fortunately, FEMA has recognized this and is in the process of shifting the map modernization effort to a new approach, RiskMAP, which is designed to significantly enhance two way communication – to and from the communities. More outreach steps and methodologies are involved and the program involves not only mapping, but assessment and planning (MAP). ASFPM is pleased with this new approach and meets regularly with FEMA and Corps officials as the processes are developed.

Accuracy
More detailed engineering studies and better topographic data will lead to better map accuracy. FEMA has been willing to accept better engineering data when that is supplied by localities, but not all localities have the capacity or funds to engage in such studies. A problem for FEMA has resulted from program metrics which have stipulated program accomplishment of new maps for certain percentage of the population by certain dates. This has led in too many instances, to production of "new" maps that may include some new data, but primarily present the old data in digitized format. Engineering and acquisition of new topographic data, where needed, can be time-consuming and expensive, but is absolutely essential to map accuracy. It may be wise to adjust the program metrics and direct the mapping effort toward improved accuracy, even if that results in production of fewer new maps each year.

Additional Mapping Tasks
To facilitate local decision making that leads to reduction of flood losses in the nation, it would be very helpful if new flood maps included additional information, such as identification of the 500-year floodplain (or 2% annual risk), areas of erosion, areas to be affected by sea level rise, to name a few. The mapping section of H.R. 3121 as passed by the Senate in the 110th Congress directs the inclusion of these elements. That legislative language also directs much improved incorporation of flood map data from other federal agencies, such as the Army Corps of Engineers' inundation maps.

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Post-Hearing Questions for the Record

Submitted to Rob Rash

From Senator Mark Pryor

"Flood Preparedness and Mitigation: Map Modernization, Levee Inspections and Levee Repairs"

July 28, 2010

1. One thing I have experienced firsthand, and something that I've heard repeatedly from states and localities is that there is a lack of information and a good deal of misinformation between the Federal agencies and state and local stakeholders.

    a. What is your assessment of FEMA's outreach to communities to communicate the purpose and implications of the flood mapping process?

Answer) FEMA has made little or no attempt to meaningful outreach to communities to communicate the purpose and implications of the flood mapping process.

The outreach that was made was organized by outside contractors or retired FEMA employees who could make no decisions or answer questions. These meetings were organized only after all decisions about the Map Modernization process had been made.

The local people were told at these meetings that it did not matter if the "Agreement" provided by FEMA was signed because these FIRM updates were imminent; that all areas protected by levees would be strongly recommended or required to purchase flood insurance regardless of level of protection.

The following is an excerpt from an undated letter received May 21, 2010 from Dr. Sandra Knight:

"I am writing this letter as an official reminder that the City of _____ has until July 6, 2010, to adopt and have the Department of Homeland Security's Federal Emergency Management Agency (FEMA) Regional Office approve floodplain management measures that satisfy 44 Code of Federal Regulations (CFR) Section 60.3(b) of the National Flood Insurance Program (NFIP) regulations.

The City of _____ must adopt floodplain management measures, such as a floodplain management ordinance, that meet or exceed the minimum NFIP requirements

(copy enclosed) by July 6, 2010, to avoid suspension from the NFIP. If suspended, your community becomes ineligible for flood insurance through the NFIP, new insurance policies cannot be sold, and existing policies cannot be renewed.

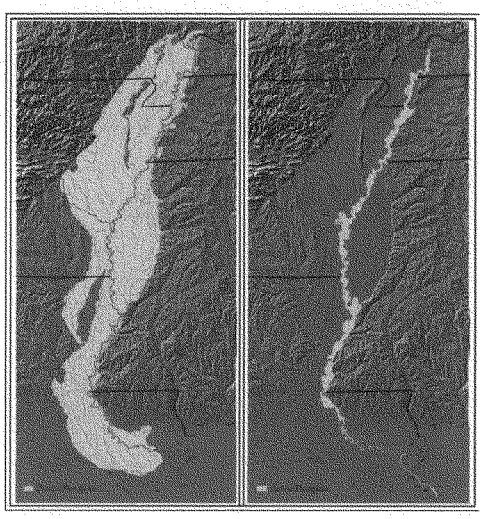
The provisions of Section 202(a) of Public Law 93-234, as amended prohibits Federal officers or agencies from approving any form of loan, grant, guaranty, insurance, payment, rebate, subsidy, or disaster assistance loan or grant, for acquisition or construction purposes within Special Flood Hazard Areas (SFHSs), subject to inundation by the base (1-percent-annual-chance) flood. Your community's suspension from the NFIP would prohibit mortgage loans guaranteed by the Department of Veterans Affairs, insured by the Federal Housing Administration, or secured by the Rural Economic and Development Services. This prohibition also affects the disaster assistance in connection with a flood under the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988, as amended.

Furthermore, Section 202(b) of Public Law 93-234, as amended, requires Federally regulated lending institutions to notify the purchaser or lessee of improved real property located in an SFHA, whether Federal disaster assistance will be available when the property is being used to secure a loan that is being made, increased, extended, or renewed."

This letter hardly communicates the purpose of the flood mapping process.

b. Have any of you found issues with FEMA and the Corps reaching out to state officials and not local officials or vice versa?

Answer) I have found the entire process extremely cumbersome and confusing. FEMA and the USACE Headquarters have blamed each other for issues brought to their attention while sitting at the same table. However, one thing that both parties remain consistent on is forcing flood insurance and floodplain management tactics on all newly mapped "floodplains" regardless of protection from levees. The following map shows the



"floodplain" both Pre and Post Mississippi River and Tributaries Project construction. The Pre construction flooding is that found in 1882. This is the "Floodplain" the Shaded Zone X represents. This 1882 flooded area is used to scare people into purchasing flood insurance!

2. What are your final recommendations for the Corps, FEMA and Congress to address any overarching issues you face or have identified in order to improve the flood mapping process?

Answer) The Mississippi River & Tributaries Project (MR&T) is a unique and totally different project than anything else in the country. No project in this country is built to control rainfall events for 41% of the continental U. S. except for the MR&T. This project is a system that has provided protection for 82 years with no breach or overtopping.

The use of a "one size fits all" approach is a good way to create a funding mechanism for future disasters but a poor way to "accurately" inform the public of their risk. This method should be adjusted to accurately inform the public of their level of protection and a separate designation should be placed on all MR&T Certified Levees.

Recommendations

1. Provide a detailed engineering analysis that accurately identifies the level of protection and separates the MR&T Project from other levees.

   FEMA's approach is that all levees will fail and all of their "Floodplain Analysis" is directed to creating false fear and scaring mortgage companies and other lenders into requiring the purchase of flood insurance.

   While we understand there is work to be done on the MR&T, both maintenance and construction, please do not allow the current path of FEMA to continue. This path will destroy economic development in all areas even those properly protected!

2. Place the information provided on the FEMA Region VI Study Factsheet on all floodmaps and provide this information to all mortgage companies and lending institutions and adjust to read as follows:

   Shaded Zone X (Areas protected by levee) – In moderate-to-low risk areas, the risk of being flooded is reduced but not completely removed. The Shaded Zone X areas shown on your maps indicate areas protected by the Mississippi River and Tributaries Project. A levee is generally designed to control a certain amount of floodwater. Flooding can also damage levees, allowing floodwaters to flow through an opening, or breach. **Structures in Shaded Zone X areas are not required to purchase flood insurance.**

3. Properly and accurately identifying areas of lifelong flooding instead of removing the levees in place to identify the Shaded Zone "X". This method of identification purposely ignores all flood control structures and removes any protection at all on the FIRM.

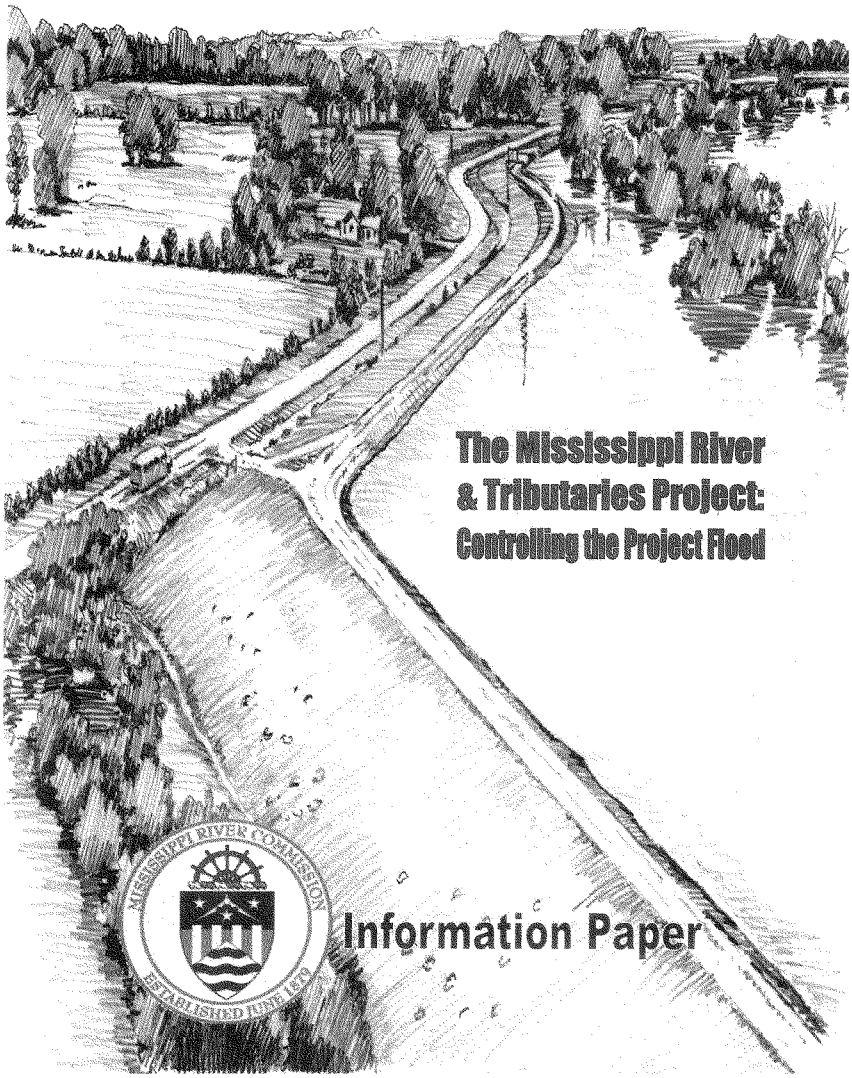
4. Do not allow shortsighted bureaucratic goals to destroy the economic development in the Mississippi River Valley or throughout this great nation. The present course taken by FEMA needlessly frightens lenders and mortgage companies into requiring flood insurance. The areas protected by the MR&T system have proven themselves for the last eighty-two (82) years and deserve a separate designation that states "This area protected by an MR&T Levee system. No flood insurance or floodplain management required."

5. Require the USACE to uphold the 1928 Act and stand up for and be proud of the finest flood control project ever designed.

   The changes in inspection, certification and maintenance requirements have been forced upon the local people. These changes in standards have been implemented with no input from the local people and no time for implementation.

   The new standards for levee inspections have been written so stringent that very few, if any, levees will ultimately pass. The Periodic Inspection process could be a very useful tool if utilized for protection and not for flood insurance requirements. The new standards should be implemented over time and not overnight. Please give the local people time to adapt to these new regulations. As "partners" with the USACE for over 100 years and protection for 82 years with no breach or overtopping by any MR&T levee in that time we should be given time for implementation of new regulations!

6. The Mississippi River and Tributaries Project (MR&T) has cost a total of over 30 billion dollars. Fourteen billion Federal and approximately 17 billion in today's dollars of local money have gone into its planning, design, construction and maintenance. Do not allow the creation of a funding mechanism to disregard the cost sharing of the citizens in the Mississippi River Valley! Please keep one disaster from creating many more future disasters by destroying the economic development we have worked so hard to build!



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The Mississippi River & Tributaries Project

Controlling the Project Design Flood

Following the Great Mississippi River Flood of 1927, the nation galvanized in its support for a comprehensive and unified system of public works within the lower Mississippi Valley that would provide enhanced protection from floods, while maintaining a mutually compatible and efficient Mississippi River channel for navigation. Administered by the Mississippi River Commission under the supervision of the Office of the Chief of Engineers, the resultant Mississippi River and Tributaries (MR&T) project employs a variety of intensely managed engineering techniques, including an extensive levee system to prevent disastrous overflows on developed alluvial lands; floodways to safely divert excess flows past critical reaches so that the levee system will not be unduly stressed; channel improvements and stabilization features to protect the integrity of flood control measures and to ensure proper alignment and depth of the navigation channel; and tributary basin improvements, to include levees, reservoirs, and pumping stations, that maximize the benefits realized on the main stem by expanding flood protection coverage and improving drainage into adjacent areas within the alluvial valley.

Since its initiation, the MR&T project has brought an unprecedented degree of flood protection to over 4.5 million people living in the 35,000 square-mile project area within the lower Mississippi Valley. The nation has contributed $13 billion toward the planning, construction, operation, and maintenance of the project and, to date, the nation has received a 27 to 1 return on that investment, including $350 billion in flood damages prevented. Such astounding figures place the MR&T project among the most successful and cost-effective public works projects in the history of the United States.

The Project Design Flood

The success of the MR&T flood control program is rooted in a profound change in engineering policy the evolved after the 1927 flood. Prior to that tragic flood event, the control of floods on the lower Mississippi was attempted by building levees high enough to withstand the last great flood of record.

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The Mississippi River & Tributaries Project

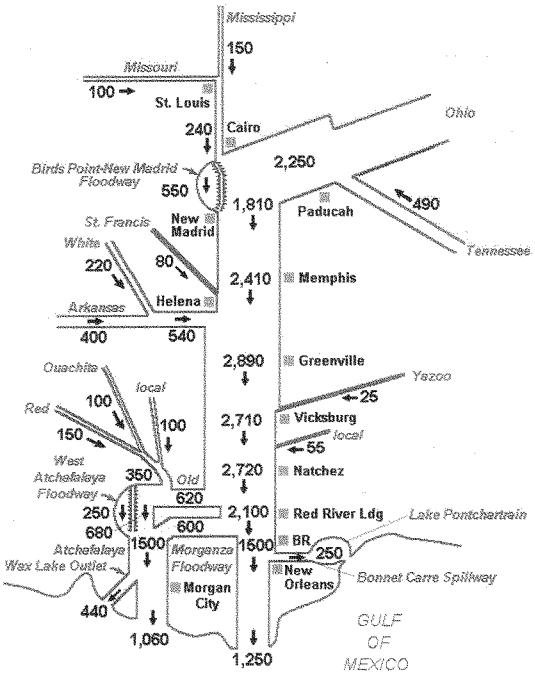
Controlling the Project Design Flood

Since the inception of the MR&T project in 1928, however, the comprehensive flood control program is designed to control the "project design flood."

The current project design flood, developed between 1954 and 1955 at the request of the Senate Committee on Public Works, resulted from a thorough and cooperative effort by the Weather Bureau, the U.S. Army Corps of Engineers, and the Mississippi River Commission that incorporated previously unavailable data regarding the sequence, severity, and distribution of past major storms and investigated 35 different hypothetical combinations of actual storms that produced significant amounts of precipitation and runoff.

The historical storms were arranged sequentially to mimic frontal movements and atmospheric situations consistent with those occurring naturally to determine the most feasible pattern capable of producing the greatest amount of runoff on the lower Mississippi River.

This included the consideration of storm transpositions, storm intensity adjustments, seasonal variations, and storm mechanics. In simpler terms, the project design storm series was developed from various combinations of actual storms and resultant floods—referred to as hypo floods—that had a reasonable probability of occurring from a meteorological viewpoint.



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The Mississippi River & Tributaries Project

Controlling the Project Design Flood

The study revealed that Hypo-Flood 58A had the most probable chance of producing the greatest discharge on the lower Mississippi River from Cairo to the Gulf of Mexico. Three severe storms comprised

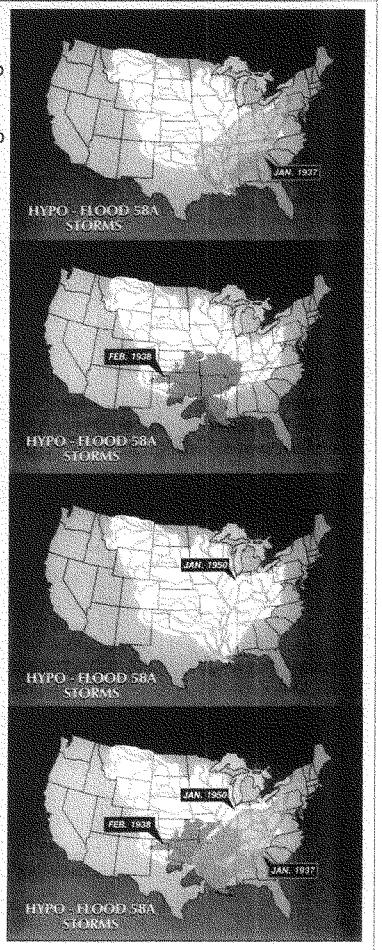
The first storm is the 1937 storm that struck the Ohio and lower Mississippi River basins, with runoff increased by 10 percent. It is followed three days later by the 1950 storm over the same general area. This storm is followed three days later by the 1938 storm, with its center transposed 90 miles to the north and the rainfall pattern rotated by 20 degrees to maximize its coverage over all the tributary basins on the lower Mississippi River.

To convert Hypo-Flood 58A into the project design flood, the Mississippi River Commission developed the flood flows that would occur from the three storms and routed them through the tributary systems under three conditions: unregulated by reservoirs; regulated by reservoirs in existence; and regulated by existing reservoirs, plus those proposed to be constructed in the near future (1960 timeframe).

The flood flows were then routed down the Mississippi River to determine the peak discharges at key locations.

The Mississippi River Commission selected the 58A flood with near-future reservoirs condition, referred to as 58A-EN (existing or near completion), as the basis for the project flood flowline and adopted it as the project design flood in 1956.

The peak discharges for the revised project design flood, which has no assigned flood frequency, were 2,360,000 cfs at Cairo; 2,890,000 cfs at Arkansas City, and 3,030,000 cfs at the latitude of Red River Landing.



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The Mississippi River & Tributaries Project

Controlling the Project Design Flood

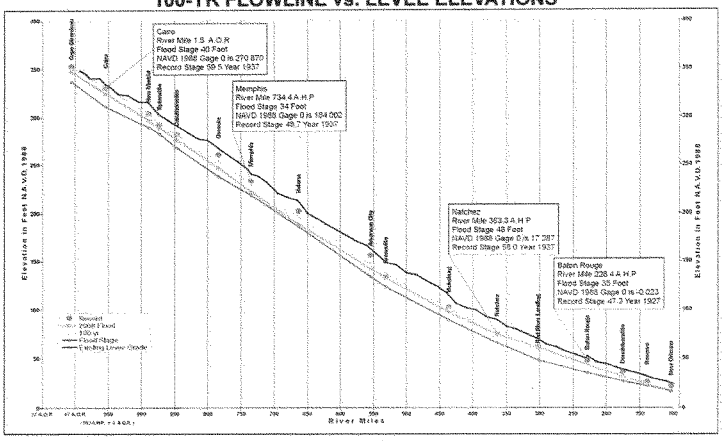
Following the 1973 flood, the Mississippi River Commission once again reviewed the adequacy of the project design flood. The review concluded that the thorough approach used in 1954-55 was based on sound technology that was still reliable by current standards. The project design flood peak discharges remained unchanged. The current project design flood—regulated by reservoirs—is about 25 percent greater than the devastating 1927 flood.

Conveying the Project Design Flood

Levee System

Levees are the mainstay of the MR&T project flood-control plan. The system protects the vast expanse of the developed alluvial valley from periodic overflows of the Mississippi River. The main stem levee system begins at the head of the alluvial valley at Cape Girardeau, Missouri, and continues to Venice, Louisiana, approximately 10 miles above the Head of Passes near the Gulf of Mexico. The MR&T levee system includes 3,787 miles of authorized embankments and floodwalls. Of this number, nearly 2,216 miles are along the main stem Mississippi River and the remaining levees are backwater, tributary, and floodway levees. No project levee built to Mississippi River Commission standards has ever failed, despite significant floods in 1937, 1945, 1950, 1973, 1975, 1979, 1983, 1997, and 2008.

MISSISSIPPI RIVER LEVEES
100-YR FLOWLINE vs. LEVEE ELEVATIONS



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The Mississippi River & Tributaries Project

Controlling the Project Design Flood

The grade and section of the present levee system dwarfs by comparison those of the levee system overwhelmed during the 1927 flood. In addition to higher and wider levees, the MR&T levee system design incorporates technological breakthroughs from the science of soil mechanics that take into account the type, condition, and moisture content of material used in the construction of the levees.

The integrity of the current levee system is enhanced by advancements in the design, construction, installation, and maintenance of seepage control measures, to include landside berms, drainage trenches, drainage blankets and relief wells. More than 1,000 miles of articulated concrete mattress revetment also protect the levee system by preventing erosion.

In an effort to further guarantee the soundness of the levee system, levee districts and other local sponsors implement strict levee maintenance programs with their own labor and funds. Normal operations and maintenance activities conducted daily by local sponsors include mowing, clearing brush and trees, filling holes, restore rain washed areas, clearing drainage ditches, correcting drainage problems, and spraying chemical to control noxious and unwanted growth.

This effort is augmented through daily inspections by pasture tenants who depend on a sound and reliable levee system to protect their lives, homes, and property from destructive floods. Together these inspections are also used to identify any deficiencies and weak spots in the levee system so that immediate corrective actions can be taken. The addition of 15-foot wide, all-weather access roadways on top of the levee system aids federal personnel and local levee districts during the inspection process and during flood-fighting operations, when the level of intensity of daily inspection increases.

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Personnel from USACE Districts additionally ensure that maintenance requirements are met through annual inspections.

To maximize protection from floods, current levee grades provide for freeboard--the distance between the project design flood flowline and the top of the levee. The presently-authorized freeboard is a minimum of three feet above the project design flood on the Mississippi River levees below Cairo, Illinois, and two feet on the Atchafalaya basin floodway levees. Levee grades between Cape Girardeau and Cairo and along the south banks of the Arkansas and Red rivers provide for a 3-foot minimum freeboard over the maximum tributary flood meeting the maximum flood of record on the Mississippi River, with provisions to insure that the same flood meeting the project design flood will not overtop the levee. In the vicinity of New Orleans, Louisiana, project levees are authorized up to 5.7 feet of freeboard because of the increased danger to the urban areas from wave wash and storm surges that are common along coastal areas.

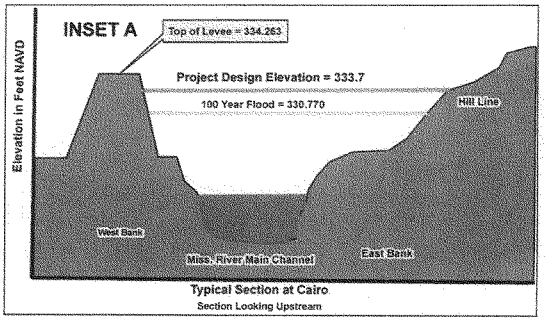
When flood stages begin to approach project design flood dimensions, additional project features are operated to control and convey potentially-damaging floodwaters to relieve stress on the levee system. A synopsis of how the MR&T project features in the northern, middle, and southern section of the project convey the project design flood follows.

Northern Section

The first key location on the flood control system is in the vicinity of Cairo. When the flood stage reaches a critical level at Cairo, the Birds Point-New Madrid floodway is placed into operation to prevent the project flood from exceeding the design elevation at and above Cairo and along east bank levee adjacent to the floodway. The floodway varies in width from about three to ten miles and has a length of nearly 36 miles.

The floodway is designed to divert 550,000 cfs from the Mississippi River during the project flood and provides about seven feet of stage lowering in the vicinity of Cairo, with smaller reductions above Cairo and through the floodway reach.

The floodway has two fuseplug levees at its upper and lower end.



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The fuseplug sections are levees constructed to a lower height than the main stem levees. The floodway is activated when sections of the frontline levee naturally overtop or are artificially crevassed. The floodway requires timely operation to ensure its design effect during a flood approaching the project flood magnitude. For this reason, the plan of operation involves the placing and detonation of explosives at the required crevasse locations.

The operation of any floodway within the MR&T project is directed by the president of the Mississippi River Commission after consultation with the Chief of Engineers. The Birds Point-New Madrid Floodway, completed in 1933, has only been operated during the 1937 flood.

There are two major reservoirs—Kentucky and Barkley lakes—on the Tennessee and Cumberland rivers that are not features of the MR&T project, but are authorized through the 1944 Flood Control Act to reduce flood stages on the Mississippi River in the vicinity of and downriver from Cairo.

Because of the close proximity of the reservoirs to the Birds Point-New Madrid floodway, their regulation has a major predictable impact on the operation of the floodway. The impacts of these reservoirs were accounted for in the development of the MR&T project design flood.

The 1944 Flood Control Act directs the Tennessee Valley Authority (TVA) to regulate the release of water from the Tennessee River into the Ohio River in accordance with instructions from the Corps of Engineers. Objectives developed by the Corps of Engineers Lakes and Rivers Division for the Kentucky-Barkley reservoir outflows have priorities to safeguard the Mississippi River levee system, to reduce the frequency of use of the Birds Point-New Madrid Floodway and to reduce the frequency and magnitude of flooding of lands along the lower Ohio and Mississippi rivers which are unprotected by levees.

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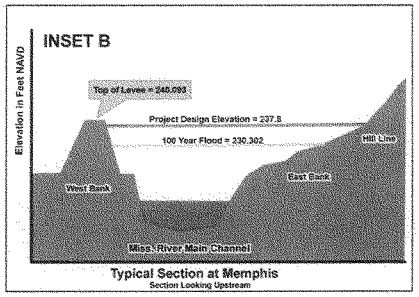
When flood control within the Mississippi Valley and/or the MR&T project is threatened, the Mississippi River Commission president and the Great Lakes and Ohio River Division commander—a position that also serves as a member of the Mississippi River Commission—work together to regulate releases from Barkley and Kentucky lakes with the concurrence of the general manager of the Tennessee Valley Authority to accomplish these objectives.

Middle Section



Between the lower end of the Birds Point-New Madrid floodway and the Old River Control Complex, the project design flood is confined by levees on the west bank and levees and a high bluff on the east bank.

The confinement of the project design flood in this stretch of the river was made possible by a comprehensive dredging program conducted between 1932 and 1942 that greatly improved the carrying capacity of the channel and lowered the project flood flow line. The levee system in this segment of the project is supplemented by four backwater areas located at the mouths of the St. Francis, White, Yazoo, and Red rivers. Significant portions of the upper sections of these backwater areas are protected by main stem levees from overflows of the Mississippi River. The lower portions of these areas serve as natural storage areas during floods approaching the project flood design. The backwater areas are placed into operation by overtopping at a time sufficient to reduce project flood peak stages. When flood stages on the Mississippi River or its tributaries subside, floodwaters from within the backwater areas evacuated through floodgates.

The next key location on the flood control system is the Old River Control Complex at the head of the Atchafalaya River basin. The control complex was constructed to prevent the Atchafalaya from capturing the Mississippi River.

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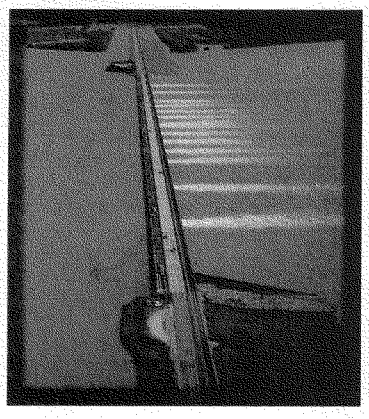
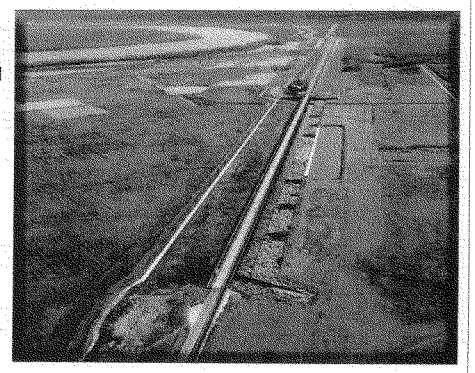
The complex is designed to maintain the 1950 flow distribution between the Mississippi River and the Atchafalaya River of 70 percent to 30 percent, respectively. Three separate structures comprise the Old River Control Complex. The low sill structure and the auxiliary structure remain operable at all river stages, but the overbank structure is only operated during flood stages. During project flood conditions, the Old River Control Complex is designed to divert 620,000 cfs from the Mississippi River to the Atchafalaya River.



Approximately 30 miles downstream from Old River, the MR&T flood control plan provides for a major diversion of floodwaters from the Mississippi River to the Atchafalaya basin through the Morganza Floodway.

Governed by a 3,900-foot long and a 125-bay intake structure, the floodway is designed to divert 600,000 cfs from the Mississippi River during the project design flood. The Morganza Floodway is operated when the Mississippi River flows below Morganza are projected to exceed 1,500,000 cfs, thereby assuring that flows between Morganza and Bonnet Carré remain at or below 1,500,000 cfs. The Morganza Floodway, completed in 1953, has only been operated during the 1973 flood.

The West Atchafalaya Floodway extends along the west side of the Atchafalaya River. The floodway contains an 8-mile long fuseplug section of levee at the head of the floodway. The floodway is designed to divert 250,000 cfs and is placed into operation when the fuseplug section is crevassed or when the west bank Atchafalaya River levee is overtopped.



The West Atchafalaya Floodway would be the last feature of the flood control system to be used under the project design flood. It has not been operated to date.

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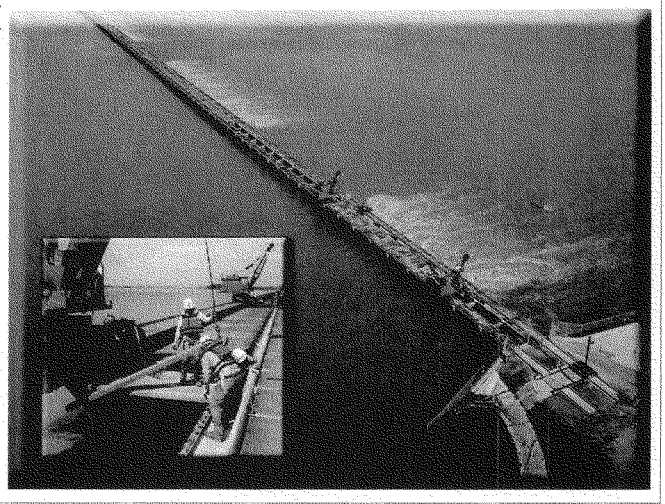
The Atchafalaya River, the Morganza floodway, and the West Atchafalaya floodway converge at the lower end of the Atchafalaya River levees to form the Atchafalaya basin floodway. This floodway is designed to carry 1,500,000 cfs or nearly one-half of the project flood discharge of 3,000,000 cfs at the latitude of Old River. The floodway is confined on either side by levees to a point below the latitude of Morgan City, Louisiana, whereby 1,200,000 cfs is conveyed to the Gulf of Mexico by the Atchafalaya River and the remaining 300,000 cfs is passed to the Gulf through the Wax Lake outlet.

Southern Section

The flood control system provides protection against the remaining 1,500,000 cfs in the Mississippi River below the Morganza floodway. The next key location in the system is the Bonnet Carré Floodway, located approximately 30 miles above New Orleans, Louisiana. The 7,200-foot long spillway structure is governed by 350 intake bays and connects to a 5.7-mile long floodway that empties into Lake Pontchartrain.

The floodway is designed to divert up to 250,000 cfs from the Mississippi River, thereby insuring a peak discharge flow under project flood conditions at New Orleans not to exceed 1,250,00 cfs. Since its completion in 1932, the Bonnet Carré Floodway has been operated 9 times—1937, 1945, 1950, 1973, 1975, 1979, 1983, 1997, and 2008.



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Post-Hearing Questions for the Record
Submitted to Dr. Joseph Suhayda
From Senator Mary Landrieu

"Flood Preparedness and Mitigation: Map Modernization, Levee Inspections and Levee Repairs"
July 28, 2010

Coastal Restoration Projects

1. You mentioned in your statement that "receiving credit for (coastal restoration projects from) the Corps of Engineers has been a problem…in the map modernization process."

- Please elaborate on this issue.

The Louisiana Master Plan for Coastal Protection and Restoration envisions using coastal restoration landscape features, such as barrier islands, marshes, ridges and forests to reduce hurricane surges and waves as part of the flood protection system for the state. This concept is new and has not been accepted by the U. S. Army Corps of Engineers. We believe we can achieve significant reduction in surge and waves by building restoration projects in front of levees, and thereby gain increased flood protection for the levee system. Thus a 100 year protection system could be improved to 200 or 300 year protection. The restoration project would also reduce maintenance costs and damage to the levees during storms. FEMA currently has no clear policy that expressly addresses thus issue. We would like to discuss with FEMA establishing a Conditional Letter of Map Revision (CLOMR) like process for PRE-QUALIFYING coastal restoration projects for inclusion in hazard mapping and in the development of the Flood Insurance Rate Maps (FIRMs). Establishing these FEMA guidelines could greatly improve the level of hurricane protection for Louisiana communities and result in reduced flood damage and costs to the National Flood Insurance Program.

V-Zones

2. Federal regulations prohibit funding for new construction in coastal high-velocity zones known as V-Zones, and this rule has caused significant problems for Louisiana residents in Cameron, Terrebonne, Lafourche, and St. Tammany Parishes.

- Can you talk about the impact of this rule on Louisiana's coastal communities and the challenge it has presented for recovery projects?

Many of our V-Zone issues in regard to re-building public facilities have been resolved due to the FEMA changing the zone designations as a result of appeals or that the damaged building falling into the less than 90% damage directive. The "big picture problem" is there should not be a problem building in a V-zone. Parishes are following the International Building code and we are elevating higher. FEMA has always had guidance on V-Zone construction for private residential buildings. If another hurricane occurs and we want to re-build in a V-zone, we are uncertain that FEMA is going to work with us to

find a way to allow the construction. This prohibition on reconstruction of public buildings in a V-Zone is a misinterpretation on FEMA's part. The Office of Inspector General agrees that there is nothing wrong with constructing in a V-Zone.

- You mentioned in your statement that "interpretation of the plain language of the FEMA regulations has been a continuing problem." Do you believe that FEMA properly interpreted its authority to waive this restriction in the communities you've represented?

I don't think FEMA has ever waived any restrictions, they just found a way to allow things to happen. All of the V-Zone problems began when FEMA Director, Paulison misinterpreted the FEMA regulations regarding the application of the preliminary DFIRMs as the "best availbel information". When FEMA makes a mistake, they should have a mechanism for correcting it as soon as possible. This does not generally happen with FEMA. That said, the local FEMA representatives havs been very creative in helping us get our V Zone Public Facility Re-build projects funded.

Post-Hearing Questions for the Record
Submitted to Dr. Suhayda
From Senator Mark Pryor

"Flood Preparedness and Mitigation: Map Modernization, Levee Inspections and Levee Repairs"
July 28, 2010

1. One thing I have experienced firsthand, and something that I've heard repeatedly from states and localities is that there is a lack of information and a good deal of misinformation between the Federal agencies and state and local stakeholders.

    a. What is your assessment of FEMA's outreach to communities to communicate the purpose and implications of the flood mapping process?

A general concern has been about the process used to develop the maps. While there were meetings held initially to explain the reason for undertaking the revision of the maps and a pledge to involve the communities in the process, that involvement did not happen. Initially parish personnel attended several meetings and through these meetings were left with the impression that no significant changes to our BFE's would be forthcoming. From this minimal outreach, FEMA then developed a map that increased the BFE's through most of the state by several feet and changed zone designations. They then delivered the maps to us. This occurred while other maps were unchanged or had BFE's reduced.

If I were managing that project and it yielded that kind of change, I would have been concerned about their accuracy and would have at a minimum engaged the City to review before presenting. Remember no levee construction took place in the Parish since the last maps were issued except in Morgan City.

Once the maps were presented and we had the opportunity to review them we did find errors some of which could have been addressed informally rather than through the appeal process.

The appeals process has now run almost 2 years. In that process parishes have expended their own funds to not only address the appeal issues but we have had to hire people to go into the field and gather data that FEMA should have gathered in their process.

Through out this entire process, most of the parishes never had a call from FEMA to give us a status report, ask a question, or to make a comment or a commitment. Every contact we have with FEMA since the presentation of the maps has been initiated by either us or our consultants. We don't believe this is the way to provide customer service.

    b. Have any of you found issues with FEMA and the Corps reaching out to state officials and not local officials or vice versa?

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Contact has been for the most part directly with the parishes. This is the route that is specified in the FEMA regulations. We could expand the involvement of the state through a state-wide CTP, which would allow for a more consistent and continuous interaction with FEMA.

2. What are your final recommendations for the Corps, FEMA and Congress to address any overarching issues you face or have identified in order to improve the flood mapping process.

One suggestion I would have for FEMA would be a requirement that they provide all data and reports that went into creating the FIRMs prior to the 90 day appeal period. This would have addressed much of the problem that several of the parishes faced with this process.

The USACE utilizes STWAVE wave model while FEMA utilizes WHAFIS. STWAVE provides wave heights along an entire flow plain as well as along a single alignment (transect), while WHAFIS only produces wave heights along the single transect. Both models build upon the USACE ADCIRC still water elevations. Standardization of wave modeling berween the two agencies would reduce unnecessary redundancy, be more versatile and reduce costs of map modernization to taxpayers.

FEMA Guidance for assigning partial credit for surge protection in the modeling of coastal structures (highways, berms, spoil banks, bike paths, railroad embankments, etc.), lends itself to "best professional judgment", which may result in inconsistent application across local communities with similar issues. More detailed guidance form FEMA is needed to avoid problems associated with "best professional judgement".

Several local communities in Louisiana already have CTPs with FEMA. The proposed formalization of the CTP with the State would standardize the process for all Louisiana communities. It will provide essential participation for to those small communities that do not have adequate staff or budget to currently participate.

There needs to be some requirement by NFIP that no checks for claims are issued unless a permit is applied for at the local permitting office, that there is some proof of application for a building permit. Immediately after a disaster the permits are issued for free, so requiring a permit application isn't a money grab by the parish. The problem arises when individuals process their claims through NFIP and then start the repair work and parish offices have no records of the construction. What proceeds construction is the important point. Usually the NFIP sends in monitors approximately a year after the disaster to the local permitting office and asks for the permit records of these claims and we are held responsible for not having permits. I realize that NFIP wants to get the checks out as quickly as possible but they're not helping the local permitting office with their compliance responsibilities.

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