

**THE MIDWEST FLOODS: WHAT HAPPENED AND  
WHAT MIGHT BE IMPROVED FOR MANAGING  
RISK AND RESPONSES IN THE FUTURE**

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**HEARING**  
BEFORE THE  
**COMMITTEE ON**  
**ENVIRONMENT AND PUBLIC WORKS**  
**UNITED STATES SENATE**  
**ONE HUNDRED TENTH CONGRESS**  
SECOND SESSION

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JULY 23, 2008  
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COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

ONE HUNDRED TENTH CONGRESS  
SECOND SESSION

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## **THE MIDWEST FLOODS: WHAT HAPPENED AND WHAT MIGHT BE IMPROVED FOR MAN- AGING RISK AND RESPONSES IN THE FU- TURE**

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**WEDNESDAY JULY 23, 2008**

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

The full committee met, pursuant to notice, at 9:30 a.m. in room 406, Dirksen Senate Office Building, Hon. Barbara Boxer (chairman of the full committee) presiding.

Present: Senators Boxer, Bond, Carper, Klobuchar.

### **OPENING STATEMENT OF HON. BARBARA BOXER, U.S. SENATOR FROM THE STATE OF CALIFORNIA**

Senator BOXER. Good morning. I was sorry to hear that Senator Harkin is ill this morning. We are very happy to see Senator Grassley here, and I understand Senator McCaskill is trying to change her schedule and join us.

Today the Committee meets to examine the Midwest floods of 2008 and consider ways of improving flood protection and flood response. I think all of America was shocked to see what happened, Senator Grassley. We want to help, this Committee wants to help.

We are joined today not only by right now, Senator Grassley, and we hope other Senators, but by the Assistant Secretary of the Army for Civil Works, John Paul Woodley, and Brigadier General Michael J. Walsh, Commanding General U.S. Army Engineer Division Mississippi Valley. But before we hear from the Corps, we are so happy to have before us Senator Grassley. I want to welcome you.

Your constituents have suffered through a terrible season of devastating flooding and the Committee looks forward to hearing your testimony. This summer's flooding in Illinois, Indiana, Iowa, Wisconsin, Minnesota and Missouri, those floods resulted in unusual heavy precipitation which inundated the Midwestern region of the U.S. throughout the early part of 2008. It appears to be continuing into the summer.

According to data from the Department of Commerce, over 1,100 daily precipitation records were broken across the Midwest, mostly in Iowa, Illinois, Wisconsin and Missouri. Further complicating matters is that prior to June's extreme rains, much of the upper Mississippi Basin had already experienced very wet conditions from the spring and the winter. Indeed, precipitation across the upper Mississippi from December 2007 through December 2008

was the second wettest since 1895. Naturally, this already over-saturated region could not stand much more, and the impacts were devastating.

I would like to take a few moments to share a few images of this catastrophic event. Here is a levee breaching in Missouri. Then a levee breaching, damaging homes. This is an aerial view of what happens when a levee breaches. And then, homes destroyed. This chart dramatically shows just how terrible flooding can be with homes and other structures uprooted and slammed into a bridge.

But there can be some statistics that are just as dramatic as pictures. At least two dozen people died, and 148 people sustained injuries due to the floods. Forty-one levees overtopped in Iowa, Indiana, Illinois and Missouri. Tens of thousands of people had to leave their homes to escape the flooding. Many economists predict that the floods are to blame for at least \$8 billion in losses to crop production.

Economic damages will likely be higher after losses to livestock, farm machinery, buildings and infrastructure are accounted for. This last point is something all Americans will feel. I will let Senator Grassley tell the rest of the story.

But I believe these tragic floods have served as a wake-up call. Our Nation's water infrastructure needs to be carefully reviewed and carefully shored up. Having led a congressional delegation to New Orleans last year, I saw for myself what happens when we neglect our Nation's flood control infrastructure. Like Hurricane Katrina, there is a lesson to be learned from the Midwest floods, that we must shore up our Nation's water and flood control infrastructure before catastrophe strikes, not after.

And even though most of the levees that failed in this year's flooding were non-Federal, we can do so much more to help communities protect themselves. Indeed, in the 2007 WRDA, we enacted a significant program to inventory and assess many of our Nation's levees. However, that was only the first step. I look forward to working with colleagues on both sides of the aisle to improve and expand that program to inventory and assess every levee in this Country as the Senate-passed WRDA bill included. I will be asking the Corps about that project.

I am confident that this tragedy will help recommit our Country and this Congress to shoring up our Nation's water infrastructure. Last year, I was proud to join with Senator Inhofe and all members of this Committee to lead the floor fight to overturn the President's veto of WRDA 2007, and we did it, by a vote of 79 to 14. I am very grateful for that. But like that vote, I want us to come together again. We have to tackle this problem, and it shouldn't have anything to do with party affiliation.

So I look forward to hearing from Senator Grassley and any other Senator who manages to get here this morning. And of course, I look forward to hearing from Secretary Woodley and Brigadier General Walsh. With that, I will call on Senator Bond.

**OPENING STATEMENT OF HON. CHRISTOPHER S. BOND,  
U.S. SENATOR FROM THE STATE OF MISSOURI**

Senator BOND. Madam Chair, I thank you very much for holding the hearing. My home State of Missouri, along with Senator Grass-

ley's State of Iowa, has endured flooding on the Mississippi River, we also on the Missouri River and the tributaries, as well as suffering from tornadoes this spring.

I very much appreciate your leadership in helping us get WRDA passed. I was proud to be able to join you in the veto override, because assuring appropriate water infrastructure is a vitally important responsibility that we have in Washington and this Congress bears through our Committee, environment and public works. After the 1993 floods, the first of three 500-year floods we have experienced in 15 years, I fought hard against the OMB and the Administration then, which did not want to rebuild the levees. With the help of my colleagues on both sides of the aisle, we were able to begin to restore the levees that had been destroyed in Missouri in that catastrophic flood.

I went to the White House and the President's assistant, my good friend Leon Paneta, welcomed me by calling me Mr. Levee. I said, now, Leon, that may be an insult to you, but I wear that as a badge of pride back in the heartland.

It has been a very trying year for all of us in the flood area. But one thing has rung clear: the mitigation of these disasters has been a coordinated effort among the Federal, State and local governments and volunteers. I am very proud of the work that Midwesterners did. I saw the work, particularly in Missouri, where I have made visits, as a testament to showing how bad disasters can be prevented from becoming worse disasters, when competent State and local leaders take proactive steps to mitigate circumstances on the ground.

During Missouri's recent floods, I met with volunteers from the Salvation Army, the Red Cross, Missouri's Civil Air Patrol, local law enforcement, the National Guard, local surrounding communities, and of course, representatives from the Corps of Engineers. It was really inspiring to see these people come together to protect lives and livelihoods.

Now, our National Guard acted valiantly. Their work gave businesses and families the critical time needed to move important assets out of harm's way where levees were in danger of failing. People from all walks of life and from across Missouri and the heartland have pitched in. It is truly an all hands on deck effort, and I am tremendously proud.

Madam Chair, you might be interested to know that they had so many volunteers coming in, they moved out 330,000 sand bags and they had more volunteers coming. They used all the sand bags that were available. We had thousands of volunteers ready to come in. It turned out that the levees had been weakened and the levees gave way, not because in most instances, not because of lack of sand bags, but because of animals drilling holes in the levee, and the fact that it stayed up so long. But Missouri and the Midwestern States have pulled together, done an outstanding job of preventing damage. And I was pleased to work with Senator Grassley and other Senators from the Midwest, Senator Harkin, Senator McCaskill, to fund vital programs to get our communities up and running again. We included more than \$600 million to appropriate it to the Corps of Engineers for repair of navigation and flood control structures damaged in the flood event.

What is important to focus on now is the speedy repair of damaged structures. It is my hope that the money in the supplemental appropriations will enable the Corps to expedite repair to levees, so when the next storm comes, our farms and communities will be protected. We are not holding our breath and counting on waiting another 499 years for the next 500-year flood. Five hundred year floods tend to come a little more frequently than that.

I thank you very much for holding this hearing and I look forward to working with you on this.

Senator BOXER. Yes, we will.

Senator GRASSLEY.

**OPENING STATEMENT OF HON. CHARLES GRASSLEY,  
U.S. SENATOR FROM THE STATE OF IOWA**

Senator GRASSLEY. Thank you, Madam Chairman.

What you laid out about the situation takes a lot of my statement. I want to thank you very much for highlighting. . .

[remarks off microphone].

As Senator Harkin, if he were here, and because he is ill, he can't be here, demonstrates the bipartisanship we have approached this, I like to say that in regard to this flooding, to paraphrase Senator Vandenberg in the 1940's and 1950's, he said, when it comes to foreign policy, partisanship ends at the shoreline. When it comes to flooding, partisanship in Iowa ends at the water's edge.

I thank the Committee for holding the hearing and allowing me to share with you this morning. As you know, the Midwest and especially Iowa was hit extremely hard by tornadoes, storms and flooding this spring. In Iowa, it started out by a deadly tornado ripping through my home town and the surrounding areas, causing significant damage and death.

A little more than a week later, record floods brought havoc in central and eastern parts of our State, as it has in about six or seven other States of the Midwest, maybe to a lesser extent, but still damage.

We also had another tornado sweep through the western part of our State that killed four Boy Scouts in early June. Many people saw pictures on television or in their newspapers of the damage throughout the Midwest and our State. However, those pictures hardly do justice to the historic devastation. This severe weather system caused a 500-year flood event and the rivers overtook communities.

As Senator Harkin and I toured Iowa, this became very apparent, especially when we flew over the affected areas. You could hardly see a dry piece of land between any of the cities. Our rich Iowa crop land looked like lakes; homes, public buildings and businesses being inundated with water. You could only see the tops of many buildings. It was devastating and there is hurt everywhere.

As the water recedes, people are attempting to start rebuilding their lives. However, this is frustrating and a discouraging process. Not only have folks lost their belongings, family photos, heirlooms, they are faced with many tough decisions about where they should live and how to protect themselves from having to go through this experience again.



A key component, then, in decisions for individuals and communities on how to rebuild is what type and level of flood protection that will be in place. The Army Corps of Engineers has been partnering with the State of Iowa in emergency and recovery efforts. I appreciate the assistance that they have provided to Iowans. They have been assessing the damage and the need for Federal levees affected by this disaster, and are scheduling their emergency repairs. It is my hope that my colleagues in Congress will help to provide the moneys needed for the Corps to carry out their emergency repair and to do it immediately.

Brigadier General Walsh is here. I would like to share a story which emphasizes the need for this emergency assistance. Senator Harkin and I were viewing the damage in Louisa County, and particularly the city of Oakville that was inundated. This area experienced having approximately 4,000 feet of their levee washed away. Another opening had to be cut downstream to give the water somewhere to go.

So as you can imagine, the whole town had to be evacuated. It was completely underwater, people in distress. Senator Harkin and I called General Walsh and personally asked that the Corps immediately begin assessing and putting into motion the emergency repair of the levee, and they acted accordingly, and we thank them very much for that. So we will continue to work with the Rock Island District of the Corps in these efforts.

Furthermore, after the great flood of 1993, which now may be a lesser great flood of 1993 than what we had in 2008, it was decided in 1993 that a comprehensive plan to integrate existing and needed projects into a coordinated system for flood damage reduction and flood plain management on the upper Mississippi and Illinois Rivers was warranted. Congress authorized this plan in Section 459 of the Water Resources Development Act of 1999. Earlier this year, the Army Corps completed the study. It shows that systemic flood protection is achievable. It now awaits congressional approval.

I look forward to working with this Committee in the near future in evaluating and implementing such a plan. Adequate appropriations for this effort will also be needed so work can begin to reduce the risk of a repeat flood like this year.

Thank you for letting me testify today about Iowa's floods. I would like to reiterate the need for additional Federal assistance to help the Midwest in recovery efforts. As we toured Iowa communities during the last month, and I did it as recently as Monday, once again our constituents often ask us "not to forget" about them.

So I bring that message to my colleagues. Iowans have great pride, great resilience. They aren't complainers, but they are hurt. I see it in their eyes every day as they sort through the rubble. We only ask that Congress give Iowans and those in the Midwest the same consideration that they gave victims of other major disasters.

I hope we acted, when I was chairman of a committee, responsibly after the New York disaster, after the Katrina disaster, and I would like to have the same response from Congress with this disaster, because I think it is just as bad, and encourage you to work quickly to get that help.

[The prepared statement of Senator Grassley follows:]

STATEMENT OF HON. CHARLES GRASSLEY, U.S. SENATOR  
FROM THE STATE OF IOWA

I thank the Committee for holding this hearing and for allowing me to share with you this morning. As you know, the Midwest and especially Iowa was hit extremely hard by tornadoes, storms, and flooding this spring. In Iowa it started by a deadly tornado ripping through my hometown and the surrounding area causing significant damage. Little more than a week later, record floods wrecked havoc in the central and eastern parts of our state. We also had another tornado sweep through the Western part of the state, causing four Boy Scouts to lose their lives.

Many people saw pictures on television or in their newspapers of the damage throughout the Midwest and in Iowa. However, those pictures hardly do justice to this historic devastation. This severe weather system caused a 500-year flood event and the rivers overtook our communities.

As Senator Harkin and I toured Iowa this became very apparent, especially when we flew over the effected areas. You could hardly see a dry piece of a land between any of the cities. Our rich Iowa cropland looked like lakes. Homes, public buildings, and businesses were inundated with water. You could only see the tops of many buildings. It was devastating and there is hurt everywhere.

As the water recedes, people are attempting to start rebuilding their lives. However, this is a frustrating and discouraging process. Not only have these folks lost their belongings, family photos, and heirlooms they are faced with many tough decisions about where they should live and how to protect themselves from having to go through this experience again. A key component in the decision for individuals and communities on how to rebuild is what type and level of flood protection will be in place.

The Army Corps of Engineers has been partnering with the State of Iowa in emergency and recovery efforts. I appreciate the assistance they have provided to Iowans. They have been assessing the damage and needs on the Federal levees affected by this disaster and are scheduling their emergency repairs. It is my hope that my colleagues in Congress will help to provide the moneys needed for the Corps to carry out these emergency repairs immediately.

Since Brigadier General Walsh is testifying at this hearing, I would like to share a story which emphasizes the need for this emergency assistance. Senator Harkin and I were viewing the damage in Louisa County and the city of Oakville. This area experienced having approximately 4,000 feet of their levee wash away. Another opening had to be cut on a levee down stream to give the water somewhere to go. As you can imagine, the whole town had to be evacuated. It was completely underwater and folks are distressed. Senator Harkin and I called the General and personally asked that the Corps immediately begin assessing and putting into motion the emergency repair of this levee. We continue to work with the Rock Island District of the Corps on these efforts.

Furthermore, after the Great Flood of 1993, it was decided that a comprehensive plan to integrate existing and needed projects into a coordinated system for flood damage reduction and floodplain management for the Upper Mississippi and Illinois Rivers was warranted. Congress authorized this plan in Section 459 of the Water Resources Development Bill of 1999. Earlier this year the Army Corps of Engineers completed the study. It shows that systemic flood protection is achievable. It now awaits congressional approval.

I look forward to working with this Committee in the near future in evaluating and implementing such a plan. Adequate appropriations for this effort will also be needed so work can begin to reduce the risk of a repeat of floods like this year.

Thank you again for letting me testify today about the Iowa floods. I would like to reiterate the need for additional Federal assistance to help the Midwest in our recovery efforts.

As we've toured Iowa communities during the last month, our constituents often ask us to "not forget" about them. So, I bring that message to my colleagues. Iowans have great pride and resiliency. They aren't complainers, but they are hurt. I see it in their eyes every day as they sort through the rubble. We only ask that Congress give Iowans and those in the Midwest the same consideration that they gave the victims of other major disasters. Nothing more, nothing less.

Senator BOXER. Senator Grassley, I am so pleased you are here.

At this point, I want to put into the record, without objection, Senator Harkin's testimony. It really does match yours. He is a little more specific. I hope that his staff will share it with you, because I think he outlines some very good ideas.

I won't take time, because I know all of our colleagues are under time stress. I do want to say one thing here. He says in his presentation, "To give you some idea of the magnitude of the flooding, consider that since the 1850's, the highest flood level in Cedar Rapids had been 20 feet. The levees in Cedar Rapids are at 22 feet. Last month, the water level rose to more than 31 feet, well above the estimate 500-year flood level."

[The prepared statement of Senator Harkin follows:]

STATEMENT OF HON. THOMAS HARKIN, U.S. SENATOR  
FROM THE STATE OF IOWA

Chairman Boxer and members of the Committee, I appreciate this opportunity to report to the Committee on the recent flooding in Iowa, and to share my views on the lessons we can draw from this disaster as we plan for similar events in the future.

First, I want to publicly salute the professionals in the Corps of Engineers, who worked day and night both before and during the flooding to minimize damage. In addition, local governments and many thousands of volunteers worked around the clock to fight the flood waters, and they did a magnificent job.

However, the storms and subsequent flooding were simply overwhelming. In Iowa, we had more rain in the first 6 months of this year than in any other 6-month period on record. The already-saturated soil, combined with downpours day after day, resulted in what has been characterized as worse than 500-year flood events on the Cedar River, which inundated Cedar Rapids, and on the Iowa River, which flooded Iowa City and a number of other communities.

To give you some idea of the magnitude of the flooding, consider that, since the 1850's, the highest flood level in Cedar Rapids had been 20 feet. The levees in Cedar Rapids are at 22 feet. Last month, the water level rose to more than 31 feet, well above the estimated 500-year flood level.

In addition to the flooding, Iowa has been hit by a number of devastating tornadoes. Senator Chuck Grassley's hometown, New Hartford, was hit by an F5 tornado, killing two people. Just weeks later, the same town was engulfed by flood waters when a local levee failed to protect the community. Thousands lost their homes and businesses.

The obvious lesson we have learned is that we need to substantially increase the resources devoted to preventing flood damage. The current level of funding is clearly inadequate.

I am proud to have been the chief sponsor of the 1993 Hazard Mitigation and Relocation Assistance Act, which substantially increased the FEMA mitigation program. And, now, funding has been further increased for states with an approved mitigation plan. Mitigation is absolutely crucial and we need to substantially increase our efforts.

Where we have low-lying areas that are repeatedly flooded, an excellent alternative to building levees is to convert that land to parks and recreation uses.

The Federal Government should increase assistance to cities like Davenport, Iowa, that are taking this approach. However, this approach will not work in most cases, due to topography or existing structures. I would also add that flood plain easements can be a very useful tool in rural areas as an alternative to levees.

We need a formal assessment of what worked and what did not work during the recent flooding. But there are some things that are already clear.

One obvious problem is that we have a hodgepodge of levees in Iowa and elsewhere across the Nation. Some levees are under the Corps authority, built to their specifications. Some are owned by cities. Others are owned by drainage districts or are effectively privately maintained.

The ideal would be for the Corps to have responsibility for a national network of levees. However, I believe that, at a minimum, we should start with a regular program of Corps inspections of all significant levees, as Chairman Boxer proposed in the EPW-proposed version of the Corps reauthorization.

Regrettably, that proposed program was sharply narrowed to the creation of an inventory of levees in the final version of the Corps reauthorization. That is important, but it is only an initial step. We should go further by requiring rigorous inspections that identify needed maintenance and improvements.

The Corps budgets have been excessively tight for many years. In most cases, projects have been delayed at the design phase or construction phase for long periods because of lack of funding. Projects take far too many years to complete, and

many do not get started at all. We need a substantial increase for the Corps and in many other areas of infrastructure improvement.

We need to improve our ability to predict very high flood levels. In Cedar Rapids, I am told, the modeling was not sophisticated enough to predict the kind of flooding we had in June, which was so far beyond normal boundaries. If local officials and citizens had been given warning of the potential for such a flood, they could have taken precautions accordingly, and damage could have been reduced.

Where we have reservoirs, I believe we need to consider operating with lower water levels in order to maximize flood protection. If we move major structures that might be damaged by significant water releases, this would allow for faster releases prior to water exceeding the spillway level.

When we begin a flood-control project, we need to improve the coordination between the Corps of Engineers and the USDA's watershed structure program, which constructs small flood-control structures in rural areas. These small structures can have a significant, positive impact, often at a reasonable cost. We need more conservation practices that slow the movement of water.

Today, levees across the United States are mostly 100-year-event levees. Given the realities of climate change and the greater frequency of severe weather, we need to revisit the assumptions behind this practice.

I would also like to note that a significant part of the damage in Iowa was not caused directly by the flooding rivers or tornadoes. It was caused in places where storm-water pipes and sewer pipes are combined. As the system was overwhelmed, the waste water was pushed directly into people's homes. We need to provide more support to cities as they work to modify these systems—to protect both property and the environment.

I am hopeful that the National Flood Risk Management Committee, which brings together Federal agencies as well as State and local interests, can make excellent recommendations. But the bottom line is the bottom line: We simply need more funding for flood mitigation.

I thank the Committee.

Senator BOXER. So something is happening out there. We can argue about why, and I don't want to get into it, because frankly, it is painful. We are not going to argue why. But we are going to do something about it together. I think we can. And that is the objective of this Committee under my chairmanship.

So now I am going to, because Senator Klobuchar is such a good soldier, she said, please, let's hear from our two colleagues. So, Senator Durbin, you are recognized, followed by Senator McCaskill. We really welcome you. We know your schedules are tight.

Senator GRASSLEY. Can I go?

[Laughter.]

Senator BOXER. You may leave, sir, the teacher gives you permission. We look forward to working with you and Senator Harkin as well as all the Midwestern Senators.

Senator DURBIN. I would like to defer to Senator McCaskill, please.

Senator BOXER. OK.

#### **OPENING STATEMENT OF HON. CLAIRE McCASKILL, U.S. SENATOR FROM THE STATE OF MISSOURI**

Senator McCASKILL. I would like to thank my colleague, Senator Durbin. We share a river and we are neighbors, and it was very nice of him to give me just a minute. I need to go introduce a great Missourian who is going to be confirmed as an ambassador, hopefully, today.

And I just want to say that my senior Senator from Missouri and I agree completely about this incident and the struggles Missouri has had over the last year. He and I have been together looking at damage from Mother Nature in southwest Missouri. He and I

both obviously visited the flooded areas over the last few months. And he and I stand in lockstep to try to get this thing done.

Missourians have had nine Federal disasters since June of last year. It has been a rough year. It is when it is rough that I stand in awe of the work ethic and the values of Missourians. My beloved State has the best that there is when it comes to communities that join together and do what is necessary to help one another. This flood was a great example of communities coming together and helping one another.

We need to get these levees repaired. We are grateful that none of the Federal levees were breached in this incident. But I echo Senator Bond's comment that haste is important here in terms of getting the work done and the repairs done that are necessary. Obviously, we want to stand in vigilance to make sure the bureaucratic nightmares that sometimes go with assistance from the Federal Government are kept at a minimum. I know Senator Bond and I agree on that.

I will place my statement in the record. I am very grateful to the very senior Senator from Illinois for giving me a couple of minutes so that I could weigh in on this very important issue to the State I love and to the people in that State that I love even more. Thank you, Madam Chairman.

[The prepared statement of Senator McCaskill follows:]

STATEMENT OF HON. CLAIRE MCCASKILL, U.S. SENATOR  
FROM THE STATE OF MISSOURI

Chairman Boxer and Ranking Member Inhofe, I want to thank you for holding this hearing. As you are well aware, the entire Midwest Region has been devastated by recent flooding events. Missouri alone has had 22 counties, in addition to the city of St. Louis, declared disaster areas and an excess of 300,000 acres of farm land were flooded, many of which remain under water and unable to be planted. So having this platform to express the needs of many Missourians will help send the signal that Washington is listening.

This past year, Missouri have faced significant hardship. Except for 3 days in March, Missouri has been under a State of emergency since December 2007 and has had nine Federal disasters since June 2007. In fact, in March of this year, Missouri received another significant flooding event where 72 of our counties and the independent city of St. Louis received disaster declarations. Just this one event took several lives and caused millions of dollars of damage across the state. And then we were hit again by last month's epic flooding.

Madam Chairman, I had the opportunity to view some of the affected communities both by land and by air. I was escorted by Col. Lewis Setliff of the St. Louis District of the Army Corps of Engineers who helped guide me through the damage areas and provide me details off their extensive flood fighting efforts. Remarkably, Missourians at the State and local levels came together to prevent a significant amount of damage yet, the devastation was still overwhelming. It was like flying over an ocean right there in Missouri and while it was enough to take your breath away what was more astonishing was the resilience and determination of the people I met. Missourians have an unbelievable ability to overcome when faced with tremendous challenges, just as we did after 1993, but they won't be able to do it without the assistance of the Federal Government.

Thankfully, during all of the severe weather Missouri has had this past year, none of our Federal levees were breached. This is a good sign that the repairs made along the Mississippi after 1993 were a wise investment. However, there is still work to be done. We did have several non-Federal levees breach and many others, including some Federal levees that are in need of repair. It's imperative that the Corps act swiftly to make the necessary repairs so that these communities are protected from any future weather events.

Finally, Madam Chairman, I would just like to close by stating that while this recent event has caused significant damage to thousands of Midwest communities,

I am confident that our local, State and Federal entities will do what is necessary ensure they are renewed and revitalized.

This concludes my testimony.

Senator BOXER. Thank you so much, Senator. We do look forward to working with everyone on this.

Senator Durbin, welcome.

**OPENING STATEMENT OF HON. RICHARD J. DURBIN,  
U.S. SENATOR FROM THE STATE OF ILLINOIS**

Senator DURBIN. Thank you very much, Senator Boxer. I also want to thank Senator Bond and Senator Klobuchar for being part of this hearing. It is certainly timely.

I can remember the flood of 1993. I was a Congressman and had a big chunk of our State that was under water. We had problems on the Mississippi River, problems on the Illinois River. I spent day after day, weekend after weekend, out sandbagging and working with local people. They gave us some consolation as we toiled away to try to save towns and homes and farms. They said, thank goodness this is a 500-year event. You have seen it for the last time in your lifetime and you can tell your grandkids about it.

Well, 15 years later, we had a replay of this 500-year event, which I think should give us some pause here. It isn't just the nature and scope of this disaster. It was bad in my State, much worse in Iowa, I am sure bad in parts of Missouri and other places, Wisconsin. But the fact is, it isn't just the change in weather, which I think is part of it, but it is also the change in the way we live, the way we build, and the way we develop. I think it has had an impact in terms of runoff in the water reaching levels unheard of before. That I think has challenged all of us to look honestly at some of the larger policy and program decisions made at every level, Federal, State and local, and to ask are there things, thoughtful things that we can do that acknowledge what is happening here and try to avoid it coming again.

I just have to tell you that the unusual thing about this set of disasters was I can always pinpoint the western part of my State along the Mississippi River as the most vulnerable part, and then usually the Illinois River, which feeds into it, a little bit south of where I live. This time we got hit not only in that area, but also in the southeastern part of the State, where the Wabash River and the Embra River breached the levees and the town of Lawrenceville and surrounding towns faced a lot more devastation than ever.

And then north in our State, just west of Chicago, in the Rockford-Machesney Park area, we had additional problems of flooding. Some of those poor people were in for the third flood of the year when I went to visit them in their homes. They had pulled out of their homes and then came another flood and then it receded, they started reconstruction, remodeling their homes, putting in new drywall, and then came the third flood of the year. So something is happening here that I have never seen before in the time that I have lived in this State and paid closer attention to it. I hope that we will take a look at that, too.

As Senator McCaskill said, I have to agree with her, when Mother Nature brings out here worst, people bring out their best all

across America. I am so proud in Illinois of so many people who stepped forward, local elected officials, many of whom don't get paid anything, who worked night and day to try to save their communities. People who were working for levee districts, like the Sny, which is a 53-mile long private levee maintained by farmers just north of St. Louis, Senator Bond. These men and women were working night and day to save this levee, which they maintain with their own tax dollars. They are pretty good at it, incidentally.

And we had volunteers, National Guard showed up as usual, a great number of State employees. People pitched in. Barack Obama and I were out there filling sandbags in Quincy, Illinois, trying to help local volunteers. Businesses that saw the potential damage, closing down their business and costing jobs, their workers left the offices, left their computers and were out filling sandbags. They pitched in because they knew they had to, and they did it over and over again. Those who were too young or too old and couldn't pitch in were making sandwiches and bringing out cold water to the volunteers. It was a terrific feeling, even though we were facing all this adversity, that so many people came together.

Let me tell you a quick story, I mentioned Machesney Park to you. It is a story about a woman named Stacy. The Red Cross was able to move her disabled mother to a hotel, but Stacy, her husband and four kids stayed in a car at a campsite because their home was flooded and they couldn't afford a hotel. She wasn't alone. Over 500 homes that had been affected in Machesney Park, a small community in Winnebago County, without a public works department and without any trucks or other equipment to help them with cleanup efforts. You think about what their family has been through, and I met with a lot of them. They had a smile on their face, but they were going through some tough times, and a lot of people faced even worse.

A couple of things that I thought we might think about in the future is first, rail operations. On rivers, it turns out to be a big deal. That railroad bridge can turn out to be critically important. There was a problem in 1993 with these bridges. There was a problem again in 2008. Many times, we don't have good communications between the emergency disaster agencies and the railroads. In this one situation, this railroad bridge was a swing bridge. And they were fearful that if they swung it open, it would destabilize the bridge and the waters would overcome it and knock it down. If they closed it, they were afraid that if the water got up to the bridge, it would start accumulating debris, holding back the river, putting more pressure on the levees behind it and they would fail, devastating tens of thousands of acres.

It was a terrible moral dilemma. Thank goodness, the waters started to recede and the bridge did not cause that ultimate problem. But I will just tell you that there were anxious days there when the local people didn't know where to turn and there wasn't good communication with the railroads. We can do a lot better.

I also want to tell you that even though the stories are behind us, the water is not. There are many areas still flooded, like Henderson County in my State. We have to worry about de-watering these counties. Your Committee has such an important job. I know that you have had fires in your home State, Senator Boxer, you

have talked to me about them. I know how devastating they are to the people that you represent. Senator Bond's State of Missouri, Senator Klobuchar's State of Minnesota, we have all faced these disasters.

I have felt, in the time that I have served in Congress, this is when we are called on as an American family. One of the members of our family is having a problem. It may not be in my back yard, but it is part of my family concern. This Committee, as much if not more than any other Committee in the Senate, is going to be asked to step forward. I hope that we will have an appropriations bill before we leave this year that includes a substantial commitment to disaster assistance, to give peace of mind to people in Missouri and Wisconsin and Iowa and Illinois, Minnesota and all throughout the Midwest, who want to know that at the end of the day, we are going to be there. We promised them they would, and we have to keep our word.

Thank you, Madam Chair. I ask that my statement be made part of the record.

[The prepared statement of Senator Durbin follows:]

STATEMENT OF HON. RICHARD J. DURBIN, U.S. SENATOR  
FROM THE STATE OF ILLINOIS

Before I begin, I want to thank Chairman Boxer and Ranking Member Inhofe for holding today's hearing and giving me an opportunity to talk about our experience in Illinois.

As we've just heard from Senator Harkin and Senator Grassley, Iowa and the rest of the Midwest is still reeling from weeks of flooding and tornadoes.

DAMAGE ESTIMATES

We know from the Great Flood that devastated the Midwest in 1993—and, more recently, from Hurricane Katrina and the California wildfires—that the losses from a natural disaster can be catastrophic and more than any one community or State can bear.

In Illinois, we still don't know the full extent of our losses. Damage assessments are ongoing. Some places, like Henderson County, are still underwater.

Although we were not as hard hit as our neighbors in Iowa, very early, very preliminary estimates put the costs of recovery and rebuilding for Illinois in the millions—maybe billions—of dollars.

The flooding started in early June even before the banks of the Mississippi began to overflow, along the Wabash and Embarras rivers in southeast Illinois. In Lawrenceville, over 10,000 people were without running water for more than a week.

Then, alone the Mississippi, record and near-record water levels caused levees to break, flooding hundreds of thousands of acres of farmland and forcing people from their homes in towns like Keithsburg and Gulfport.

Nearly two thousand homes have been impacted by the waters—everything from a flooded basement to complete destruction.

Farmers in my State face at least \$1.3 billion in crop damage and the loss of hundreds of thousands of acres of corn and soybean.

Floodwaters have also caused damage to roads in the tens of millions of dollars.

Then there are the losses you can't count in dollars. There are people like Stacy whose home in Machesney Park was flooded. The Red Cross was able to move her disabled mother to a hotel but Stacy, her husband, and her four kids stayed in a car at a campsite because they couldn't afford a hotel.

Stacy isn't alone. Over 500 homes have been affected in Machesney Park, a small community in Winnebago County without a public works department and without trucks or any other equipment to help with the clean-up efforts.

My heart goes out to everyone affected by the floods, especially those have watched their homes and livelihoods disappear under muddy waters.



## COMMENDING ILLINOISANS

The damage is bad, but it could have been a lot worse had it not been for the hard work and determination of everyone who helped us prepare for the floods.

They showed up day after day—Illinois residents, volunteers, emergency workers, members of the National Guard.

In cities and towns all along the Mississippi, they worked around the clock to fill sandbags and fortify levees. Even after the flooding started, they didn't stop working. It's because of their perseverance that more levees—like Sny Island's—didn't overtop.

It's not easy to stand your ground in the face of a force as mighty as the Mississippi, but these folks did just that. Their resolve and determination showed an amazing spirit at work.

It's a spirit Senator Obama and I had a chance to see for ourselves when we helped sandbag in Quincy. I saw it again and again as I visited communities hit by the floods—from Grafton, south of Quincy on the Mississippi, to Lerna and Lawrenceville on the other side of the state, to Machesney Park up north by Rockford.

No doubt it's a spirit at work today as these river communities bounce back from the flooding.

As one City Council member said about her hometown of Grafton: "Grafton people are resilient people. They're river people."

I also want to commend the Illinois departments and agencies who worked 24/7 to ensure that communities had the resources to fight the floodwaters. They're still working today to make sure these communities are equipped with the resources to recover.

I want to thank FEMA, the Army Corps of Engineers, and the other Federal agencies whose help has been essential to helping Illinois fight the floodwaters.

When Mother Nature brings her worst, we bring our best. Thanks to this team effort, even though the flooding may have been historic in some places along the river in Illinois, it looks like the damage will not be.

## LOOKING FORWARD

This is the second time in 15 years that the Midwest has been devastated by historic flooding.

The Great Flood of 1993 was one of the costliest natural disasters to hit the United States. Back then I was a Congressman in central Illinois, with a big swath of the Mississippi River in my district, and I saw the devastation first hand.

More than 50 people died and thousands more were evacuated from their homes as hundreds of levees along the Mississippi failed. The economic damage exceeded \$15 billion.

Experts told us this was a 500-year flood event. But then we found ourselves, 15 years later, facing a similar disaster.

It's clear that these 200-and 500-year flood events are happening more frequently than every 200 or 500 years. It's also clear that we need to do a better job preparing for them.

Often, weather-related disasters strike with no warning. But floods are different. We can see them coming. We can use the lessons of the past to better prepare for the future.

With that in mind, I want to offer a couple of observations from our experience in Illinois.

The first is the lack of clear direction on rail bridge operations during a natural disaster. It was a problem in 1993 and a problem in 2008. Both times the railroad companies refused to listen to the local community's concerns and to lift a bridge out of the way of oncoming floodwaters. In 1993, their refusal caused the water pressure to build and a levee to overtop. This time around, we were fortunate that the water levels were not high enough to cause a repeat of that situation.

During a flood event or other natural disaster, who has the navigation rights over an inland waterway? The answer is unclear. A second concern is dewatering.

The flooding has receded in many parts of Illinois. But there are still some places—like parts of Henderson County—that are underwater. FEMA, the Corps, the Illinois Emergency Management Agency, and locals have been working together to drain the standing floodwaters. But it's been weeks since the rain stopped falling.

There has to be a better way to coordinate among the Federal, State and local partners to more quickly help communities hardest hit by the floods get back on their feet.

## CONCLUSION

I want to thank Chairman Boxer and Ranking Member Inhofe again for this chance to speak about my state's experience. An important part of the rebuilding and recovery effort is looking back to see what lessons can be brought to bear now and in the future. These lessons help us better prepare for and mitigate the damage from future flood events.

As we move forward to work on the second supplemental, I hope we keep in mind that disasters don't end with the news coverage. There are still communities across the Midwest trying to clean up and get on with their lives. We, the Congress, have to make sure we give them all the tools they need to do that. The communities and the people affected should not face this disaster alone. America, and this Senate, will stand with them.

Senator BOXER. Absolutely. And I just want to thank you.

Yes, Senator.

Senator BOND. I just wanted to make two comments to my colleague and neighbor from across the river. No. 1, my father used to be a member of the Sny Drainage District, had a small farm at Pleasant Hill. So I know those people. They work well.

No. 2, we had the same problem that apparently Machesney Park had with the town of Plattsburg in 1993. Plattsburg was flooded out in early June, they were halfway rebuilt, they flooded out again. I believe that in that instance, the people of Plattsburg agreed to a buy-out. With the help of the Corps and the State agencies we moved them out of that flood plain. It sounds like perhaps more buy-outs will lessen the risk to people in Machesney Park. I am a supporter of that where the local officials and citizens agree.

Senator DURBIN. I might add, Senator Bond, that in the city of Valmeyer, across the river from Missouri, Congressman Costello and I worked, and they literally moved the town, picked it up and moved it to high ground. One farmer stuck around, and he had some tough times ahead of him because he did. But by and large, those who moved felt that they made the right decision.

And you also know, and I am sure the people from the Corps of Engineers can back me up, the world of levees changes south of St. Louis. North of St. Louis it is kind of a private endeavor and a local endeavor. South of St. Louis, there is much more Federal participation. I think that reflects the history of the Congress and the number of southern Senators and Congressmen who took care of their own long before you and I arrived here.

Senator BOND. Fortunately, we can still earmark.

[Laughter.]

Senator BOXER. Fortunately, we are still here, for the moment.

Senator KLOBUCHAR. Senator Durbin, you are free to go. I don't want to rush you, but I know you don't want to miss anything.

**OPENING STATEMENT OF HON. AMY KLOBUCHAR,  
U.S. SENATOR FROM THE STATE OF MINNESOTA**

Senator KLOBUCHAR. I wanted to express my sympathy to the States that were hurt even more than Minnesota, and that is particularly to Senator Grassley and Senator Harkin, to Senator Durbin and Obama in Illinois, and to Senator McCaskill and Senator Bond in Missouri and several other States that were victims of these floods.

In Minnesota, I was listening with great interest to your story, Senator Durbin, about the one farmer that stayed behind. Because

I went and toured Austin, Minnesota, about a week after the floods hit. The mayor and sheriff took me around, and the exact same thing happened. They showed me how they had moved through a long-term 10-year flood mitigation project, they had moved about 50 homes. They weren't expensive homes, so it was fairly easy to do. They had turned this whole area and the river into a park. It is a beautiful park, with bike paths, things like that. There was one guy that wouldn't take the buy-out, wouldn't move. They showed me his house; it was completely wrecked. Because he wouldn't take it.

So they were able to really tell which businesses and houses needed to move and were able to avert severe damage. It wasn't just the individual home buyers, which was interesting to me, they saved the taxpayers tons of money. Because in the other floods, in Austin, Minnesota, by the way, the home of Hormel Foods, the home of Spam, in other floods in the past, the sewer system had backed up. So it had cost taxpayers a lot of money. This time, that didn't happen at all. We saw great flood mitigation projects in Winona and in Rochester, Minnesota, so they also withstood some of the damage.

That is not to say that we didn't experience enormous damage in this flood. Several of our counties were declared disaster areas. We had the crop damage, especially with corn, and some of the farmers tried to replant with soybeans at the end. But that was difficult. Then finally, we lost the life of a man who was simply driving down a country road to help out his daughter and get a sump pump, middle of the night, storm is raging. He is driving down the road, and suddenly the pavement just went out from under him. I went to the spot, and it was like from here to that wall where the road had just broken down into the culvert behind. His car went down, another car landed on his car. And that driver, because his car was there first, actually survived, the one on the top.

But it just again brought home to me, Madam Chair, the importance of this infrastructure funding, the importance of thinking ahead with these floods, and using this as an opportunity for public works projects at a time when our economy is suffering, that we really have to focus on infrastructure.

I see our friends who are going to testify, I remember seeing you in New Orleans as we talked about the levee issues, that we should see this as a way of saving lives. But we should also see this as an economic development opportunity for our Country. Thank you very much.

Senator BOXER. Thank you, Senator.

I know both Senators have to leave. We thank you so much.

Now it is my pleasure to ask Hon. John Paul Woodley, the Assistant Secretary of the Army, Civil Works, and Brigadier General Michael Walsh, Commanding General, U.S. Army Engineer Division, Mississippi Valley, to come forward.

Mr. Woodley, we will give you 7 minutes instead of five, so that you don't have to rush through your statement. Then if you need more time, we are happy to give it to you.

**STATEMENT OF HON. JOHN PAUL WOODLEY, ASSISTANT SECRETARY OF THE ARMY, CIVIL WORKS ACCOMPANIED BY: MAJOR GENERAL DON T. RILEY, DEPUTY COMMANDING GENERAL, CIVIL AND EMERGENCY OPERATIONS**

Mr Woodley. Thank you, Madam Chair.

Distinguished members of the Committee, we very much appreciate the opportunity to testify before the Committee and report to you on the June 2008 Midwest floods.

Accompanying me today is Major General Don Riley, who is Deputy Commanding General for Civil and Emergency Operations, and Brigadier General Michael Walsh, Commanding General of the Mississippi Valley Division. General Walsh will report to you on the specifics of the recent flood, and I am going to discuss the current program activities of the Corps addressing the bigger issue of flood risk management.

I have a complete statement that I would ask for permission to put into the record.

Senator BOXER. Absolutely, it will be in the record.

Mr Woodley. Responsibility for flood risk management in the United States is shared among multiple Federal, State and local government agencies, with a complex set of programs and authorities. The Corps of Engineers and FEMA have programs to assist States and communities in reducing flood damages. However, the authority to determine how land is used in flood plains and to enforce flood-wise requirements is entirely the responsibility of State and local governments.

Many reports have offered lessons from prior floods and recommendations for the future. Common themes have included a call for improved interagency coordination and emphasis on public safety and the need for improved flood risk communication. Many have also called for greater use of flood plain management measures by local and State government, including wise land use planning, flood-proof building code requirements, easements and relocation of flood-prone structures in conjunction with traditional engineered flood water management structures.

The Midwest floods of June 2008 have again highlighted the importance of evaluating and communicating the risks to the public and decisionmakers associated with levee systems. There are many questions that need to be answered. How many miles of levees exist? What is the condition of these levees? Which entity is responsible for them? What areas are the highest risk? How should Federal, State and local resources be prioritized to reduce these risks? And what can be done together in the interim to reduce risk?

In 2006, the Corps of Engineers began a major effort to work on answering these questions. Using \$30 million of the Fiscal Year 2006 supplemental appropriation from Congress, the Corps created its Levee Safety Program to assess the integrity and viability of levees and recommend actions to ensure that levee systems do not present unacceptable risk to the public, property and environment.

Over the last 2 years, the Corps has made great strides toward a National levee inventory for levees that are active in the Corps' levee program and a methodology for technical risk assessments of existing levees. Although great advances have been made in collecting and assessing information about levee systems, much re-

mains to be done and detailed information is still needed about many Federal levees, most non-Federal Government levees and all private levees.

Also in 2006, the Corps established the National Flood Risk Management Program to take the first step of bringing together Federal agencies, State and local governments and private sector entities with a stake in flood risk management. The objective is a unified national flood risk management strategy that eliminates conflicts between programs and takes advantage of all opportunities for collaboration.

On November 8, 2007, as the Chairman has previously indicated, the Water Resource Development Act of 2007 became law. Title IX of this statute, cited as the National Levee Safety Act of 2007, calls for recommendations for a national levee safety program in addition to the inventory and inspection of levees. The Act complements many of the ongoing activities of the Corps' Levee Safety Program.

The Administration was able to include funding in its Fiscal Year 2009 budget to begin the work outlined in Section 2032 of WRDA 2007 that would assess the vulnerability of the United States to flooding. The study will assess the extent to which existing programs operate, individually and together, and develop recommendations for improving the effectiveness, efficiency and accountability of these programs.

In summary, Madam Chair, the responsibility for flood risk management in the United States is shared between multiple Federal, State and local government agencies who all must work together to effectively address these complex issues. While great strides have been made in the last 2 years with the leadership of this Committee, we remain to implement many of the things that have been put in place, and there is much work that needs to be done. I am delighted to appear before you and answer any further questions you may have.

[The prepared statement of Mr. Woodley follows:]

**DEPARTMENT OF THE ARMY**

**COMPLETE STATEMENT**

**OF**

**THE HONORABLE JOHN PAUL WOODLEY, JR.  
ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS)**

**BEFORE**

**COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS  
UNITED STATES SENATE**

**ON**

**The Midwest Floods: What Happened and What Might Be Improved for  
Managing Risk and Responses in the Future**

**JULY 23, 2008**

Madam Chair and distinguished members of the Committee, thank you for the opportunity to testify before the Committee and to report to you on the June 2008 Midwest floods.

### **Background**

Since the Flood Control Act of 1936 established a federal role in flood management, the Corps has completed approximately 400 major lake and reservoir projects, constructed over 8,500 miles of levees and dikes, implemented hundreds of smaller local flood management projects, and offered assistance to hundreds of local communities to construct their own flood damage reduction systems.

The Corps has also changed its paradigm since 1936. The Corps has transitioned from “controlling floods” to “reducing flood damages” by primarily building projects to manage the flood waters based on the economic value of the property that is at risk. Today Federal, State, and local agencies tend to jointly address the broader concept of “flood risk.” Current national policy seeks not only to reduce the probability of flood damage through construction or reconstruction of flood water management facilities such as levees, but also seeks to reduce the consequences of flooding through the use of other tools to manage the floodplains, such as land zoning regulations or response and contingency planning. Flood risk is a rough measure of the probability of flooding and the consequences of flooding.

Responsibility for flood risk management in the United States is shared among multiple Federal, State, and local government agencies with a complex set of programs and authorities. Both the U.S. Army Corps of Engineers and the Federal Emergency Management Agency (FEMA) have programs to assist states and communities in reducing flood damages and promoting sound flood risk management. The authority to determine how land is used in floodplains and to enforce flood-wise requirements, however, is entirely the responsibility of state and local governments. Floodplain management choices made by state and local officials, in turn, impact the effectiveness of federal programs to mitigate flood risk and the performance of federal flood damage reduction infrastructure.

Responsibility for the Nation’s levees is likewise shared. Over the years the Corps has built hundreds of miles of levees, typically turning them over to State or local authorities for operation, maintenance, repair, rehabilitation, and replacement once they are complete. The responsibilities of local levee partners also include levee safety, land use planning and development, building codes. Levee certification for FEMA’s National Flood Insurance Program is the responsibility of the local levee owner or sponsor. No single agency is responsible for levee oversight nationwide. The Corps has specific and limited responsibilities for approximately 2,000 levees, but this is a small percentage of the nationwide total. The Corps is by no means the only builder of levees – localities, cooperatives, and individual landowners have built the vast majority of levees currently in existence throughout the United States. Many of the Nation’s levees were first put in place by farmers to protect agricultural areas from frequent flooding. They date back as

much as 150 years, but in that time, land use has changed and development has taken place where farms were once located. These levees may appear to protect land behind them, but they often provide very limited protection from flooding.

While levees reduce the chance of flooding from certain events, the Corps is redoubling its efforts to make clear to the public that no levee completely eliminates the risks associated with flooding. Levees are designed to provide a specific level of protection and can be overtopped during flood events that exceed the design storm. Levees also decay over time; they require regular and proper maintenance and periodically must be upgraded to retain their level of protection. When levees overtop or fail, the results of the flooding can be catastrophic, and the damage may be more significant than if the levee did not exist. The vulnerability and the hazards for levee overtopping or failure need to be properly communicated.

### **Response to Midwest Floods**

In June 2008, record-breaking storms and flooding occurred across six states. This flood event set new record high water stages at numerous gage stations within the region's tributaries in the Upper and Middle Mississippi River Basin. The majority of property damage occurred along Upper Mississippi tributaries. Records show that 41 levees were overtopped (6 federally authorized (locally maintained and operated), 31 non-federal and 4 private) in Iowa, Indiana, Illinois, and Missouri.

Through the emergency authority of Public Law 84-99, the Corps worked closely with state and local emergency managers to inspect, advise, and assist communities with professional engineering expertise and materiel during flood fights. The levees, although some overtopped, worked as intended to buy critical time for local emergency management officials to safely evacuate residents. In some cases, levee performance and the actions of determined communities provided the additional time needed to reinforce and improve levees and to protect lives and property behind them.

The Corps assisted FEMA with various mission support activities including debris removal; water; commodities; temporary housing; and emergency power teams. The Corps deployed civilian experts from its offices throughout the three major inland river systems, the Mississippi, Missouri and Ohio, to monitor and assess the stability of the Mississippi River levees against forecasted river levels. The Corps worked side-by-side with local residents and municipal, State and Federal officials, including volunteers, who used 13 million Corps-provided sand bags to raise and reinforce many levees.

As the flood waters recede throughout the region, the Corps is transitioning from flood fight operations to recovery and levee repairs. In addition to providing authority to assist State and local entities during flooding, Public Law 84-99 also provides authority for the Corps to repair levees that have met minimum criteria and have been accepted into the P.L. 84-99 program. Within its Rehabilitation and Inspection Program, the Corps works with State and local partners to inspect and assess the maintenance and condition of levees that are active in the program and to repair damaged projects to pre-storm



condition and level of protection. In coordination with State and local agencies, the Corps has begun to assess the damages to the levees throughout the region. Initial damage assessments include approximately 115 projects throughout the region that have been damaged. Brigadier General Michael Walsh, Mississippi Valley Division Commander will provide more detail on the Corps response activities from the perspective of its field operating offices.

#### **Now is the Time for Change**

The Administration included funds in its FY 2009 budget to begin a study as outlined in Section 2032 of WRDA 2007 that would assess the vulnerability of the United States to flooding. The study will assess the extent to which existing programs operate (individually and together) to address flood risk reduction priorities; develop recommendations for improving the effectiveness, efficiency, and accountability of these programs; and propose a strategy to implement those recommendations. The report will look at not only programs of the Corps of Engineers, but at a broad array of Federal, state, and local programs, including flood insurance, local land use planning, emergency response and recovery, disaster assistance, and economic development programs. This important effort needs congressional support in order to continue.

As the Corps considers the aftermath of the Midwest Floods of 2008, it is clear that greater awareness is needed by the residents and business in flood plains about the risks associated with living and working behind levees. Local jurisdictions will need to make decisions about flood risk reduction, land use, and development in flood plains. Residents living in flood plains tend to forget about their risk of flooding since catastrophic floods happen so infrequently. It is prudent to remind the public that the National Flood Insurance Program administered by FEMA and even a 100-year flood levee system does not provide an elimination of risk. Frequently, the public believes a 100-year flood occurs once per 100 years, as opposed to understanding that this is only a probability of 1% occurrence in any given year. The risks need to be properly mapped and conveyed so that the public understands the risks to its community.

#### **Learning from the past**

Many reports have offered lessons learned from past flooding disasters and recommend policy reforms intended to reduce the nation's flood risks (see attached bibliography).

Common themes have included a call for improved interagency coordination, an emphasis on public safety and the need for improved flood risk communication. Many reports have also called for greater use of floodplain management measures by local and state government to mitigate flood risks, including wise land use planning, enforcing flood-proofing building code requirements, acquiring easements and relocating flood prone structures, in conjunction with traditional engineered floodwater management structures. Many reports also have called for a lifecycle approach to managing flood risk that integrates post-flood recovery efforts with long term flood risk mitigation planning.

The Corps has adopted some of these practices and is conducting its own internal evaluations to continue to improve the Corps' flood damage reduction program. After the 2005 hurricane season, the Chief of Engineers developed and the Corps is beginning implement Actions For Change, designed to improve the Corps flood program after integrating the lessons learned from the 2005 hurricane season. This important activity requires support to continue to move forward.

#### **Reducing flood risk is a shared responsibility**

A common misperception persists that the Federal government is responsible for providing fail-safe protection from flooding. This overlooks the central role played by non-Federal levels of government and private citizens in mitigating flood risk through floodplain management. In part, this misperception is perpetuated by the traditional Corps focus on the construction of visible infrastructure to reduce flood damages by decreasing the probability of flooding. In this traditional role, the Corps' decisions have been driven by reducing the economic impact of flood damages on the national economy. There are other entities that can better assess and address localized risks and consequences.

Federal programs and policies to address the nation's flood risks depend heavily upon complementary, flood-wise practices to mitigate flood risks at the state and local level of government, as well as by private citizens. This means that successful management of the Nation's flood risks requires careful and continuous coordination between the Federal and non-Federal levels of government as well as ongoing engagement with the private sector and the public. A key challenge is ensuring that as the public and government leaders make flood risk management decisions, they integrate environmental, social, and economic factors and consider all available tools to improve public safety.

This period of post-flood recovery in the Midwest is an opportunity for the Corps to work in coordination with its Federal and non-Federal partners to improve short term emergency response and post-flood recovery efforts while considering long range flood risk management planning.

#### **Path Forward**

Now is the time to make changes for better management of flood risk that will come with the next Midwest flood. Following are ongoing or proposed actions for reducing flood damages or managing flood risks in the Midwest and nationally.

#### **Interagency Levee Task Force**

Flood response, recovery and reducing flood risk are a shared responsibility. As part of the recovery process through the PL84-99 program, the Corps is developing a recovery strategy in coordination with Federal State and local partners to repair and restore the flood damage reduction systems. Addressing flood risk and flood damage reduction

prior to the next flood season is an important part of this strategy. Part of our recovery strategy will be the establishment of a regional Interagency Levee Task Force that will bring the appropriate Federal, State and local agencies together to provide a uniform approach across the impacted region ensuring that the restoration of these systems is consistent and equitable. The Interagency Levee Task Force will also provide opportunities to evaluate non-structural alternatives to reducing vulnerability to flood risks and explore other long-term mitigation initiatives and activities to improve floodplain management programs and policies. Federally authorized levees and some non-federal levees may be eligible for Corps rehabilitation assistance funding.

#### **National Flood Risk Management Program**

In May 2006, the Corps established the National Flood Risk Management Program (NFRMP) to take the first step of bringing together other federal agencies, state and local governments and agencies, and the private sector with stakes in flood risk management. The objective of the NFRMP is to develop and implement a unified national flood risk management strategy that eliminates conflicts between different flood risk management programs and takes advantage of all opportunities for collaboration.

Some of the specific goals of the program are:

- Providing current and accurate floodplain information to the public and decision makers;
- Identifying and assessing flood hazards posed by aging flood damage reduction infrastructure;
- Improving public awareness and comprehension of flood risk;
- Integrating flood damage and flood hazard reduction programs across local, state, and Federal agencies; and
- Improving capabilities to collaboratively deliver and sustain flood damage reduction and flood hazard mitigation services to the nation.

#### **Levee Safety Program**

The Midwest Floods of June 2008 have highlighted the importance of evaluating and communicating the risks to the public and decision makers associated with levee systems. There are many questions that need to be answered - How many miles of levees exist? What is the condition of these levees? 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 2006, the Corps launched a major effort in answering these questions. Using \$30 million in FY 2006 Supplemental appropriations provided by the Congress, the Corps created its Levee Safety Program with the mission to assess the integrity and viability of levees and recommend actions to assure that levee systems do not present

unacceptable risks to the public, property, and environment. In the last two years, the Corps has made great strides toward the creation of a National Levee Inventory for levees that are active in a Corps program; development of a methodology for performing technical risk assessments of existing levee infrastructure; and improvement of current related policies and procedures associated with levees. Specific activities under the Levee Safety Program include,

1. Completion of a Geographic Information Systems (GIS)-based database model to serve as the National Levee Database (NLD).
2. Initiation of the Corps levee inventory.
3. Improvements in levee inspections to make them more rigorous, consistent, and comprehensive. These improvements will assist the Corps in being able to communicate to the local sponsors and the public on the overall condition and associated risks of levee systems.
4. Establishing national teams and partnerships to focus on developing new levee policies, procedures, and technical guidance. The Corps is also seeking international partnerships, such as the existing partnership with the Dutch, in order to leverage as much experience and expertise as possible.

The NLD, although still in its developmental stages, was used during the Midwest flood event to quickly compare the profile of federally constructed levees to predict water levels to determine if overtopping of levees systems were likely. The NLD will also have the capability to log all incidents such as sand boils, slides and other problem areas. This information will be critical in assessing flood fighting capabilities for future events or the need for immediate repairs, rehabilitation or mitigation.

Although great advances have been made in collecting and assessing information about levee systems, much remains to be done. Detailed information is needed about many federal levees, all private levees, and most non-Federal levees. Many of the levees that overtopped or breached during the Midwest Floods were non-Federal and therefore, the Corps did not have detailed information which could have been useful while responding to the event.

On November 8, 2007, the Water Resources Development Act (WRDA) of 2007 was enacted into law. Title IX of this WRDA, cited as the National Levee Safety Act of 2007 (the Act), involves development of recommendations for a national levee safety program in addition to the inventory and inspection of levees. The Act compliments many of the ongoing activities of the Corps' Levee Safety Program.

- Requirement 1 of the Act is to form a "Committee on Levee Safety," to develop recommendations for a national levee safety program, including a strategic implementation plan. Technical corrections to this Act were signed into law July 15, 2008 that gives the Army the authority to fund the committee with existing funds.
- Requirement 2 of the Act is to inventory and inspect levees. The Act requires that the Secretary establish and maintain a database with an inventory of all of the

Nation's levees. The current version of the Corps' National Levee Database and associated information, which includes levees currently within the Corps program, will be used. Information relating to other levees will be inputted as it is voluntarily provided by States. The Act also requires the general condition of the levees to be entered into the database. The general condition determination is based on an onsite inspection of the levee, including a review of all design, construction, and other information available for the levee.

### **Coordinating Flood Risk Management at the National and Local Level**

The Corps has worked with FEMA and representatives of non-Federal levels of government to improve coordination through two channels, the Intergovernmental Flood Risk Management Committee and the Silver Jackets Program.

The Intergovernmental Flood Risk Management Committee (IFRMC) provides a venue for FEMA and Corps leadership to coordinate programs and policies, and thus improve program implementation for the flood risk management community. Additionally, quarterly meetings have provided an opportunity for key stakeholder groups representing the non-Federal perspective, the Association of State Floodplain Managers (ASFPM) and the National Association of Storm and Floodwater Management Agencies (NAFSMA), to provide both agencies direct feedback on specific policy and implementation issues faced at the State and local level.

Establishing the IFRMC as a forum for coordination at the senior leadership level has helped address coordination challenges by:

1. Providing a forum for the exchange of information and experiences relating to flood risk management among the senior level staff and leaders of member organizations;
2. Creating an opportunity for each member organization to identify and discuss policy and implementation issues they have encountered as barriers to effective flood risk management;
3. Creating an opportunity for Federal agencies to receive feedback from non-Federal member organizations on Federal programs and initiatives to improve flood risk management;
4. Discussing among senior leaders of member organizations flood risk management priorities; and
5. Obtaining senior leader feedback on ideas and initiatives developed by the staff of member organizations.

A key accomplishment to date of the IFRMC has been providing Corps and FEMA leadership information about the challenges in producing accurate, updated FIRMS under FEMA's MapMod program, due to aging and poorly maintained levees. This awareness provided FEMA and Corps leadership the foundation for coordinating directly to revise and improve both agencies' policies outlining the procedures for performing certification of levee systems for purposes of developing FIRMS, as well as establishing and enforcing requirements for addressing levee deficiencies in a timely manner and providing adequate operation and maintenance.

The Corps has also launched the Silver Jackets Program, to provide an avenue for interagency and intergovernmental collaboration at the State level. Through the Silver Jackets program, the Corps collaborates with FEMA and other Federal agencies 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 integrate information and resources, improve public risk communication through a united effort, and create a mechanism to collaboratively solve issues and implement initiatives.

To date, the Silver Jackets Program has initiated pilot programs in Ohio, Indiana and California. These teams have succeeded not only in improving communication, but also in leveraging resources and programs between Federal agencies. For example, coordination through the Ohio team has enabled the small community of Marietta Ohio to acquire detailed mapping of its community by tapping into an ongoing, regional watershed study, at nominal costs. Through the same Silver Jackets team, an opportunity was discovered to integrate two different programs by utilizing the Corps Planning Assistance to States Program to provide resources and FEMA's Flood Mitigation Assistance (FMA) Program to outline the requirements - resulting in the town gaining eligibility for FEMA flood mitigation funds.

The Corps is also working to collaborate with other Federal agencies that have a role in flood risk communication. In June 2008, the Corps and FEMA hosted a meeting of senior staff from Federal agencies involved in flood risk management. The objective of the meeting was to seek opportunities for improved efficiencies and greater coordination across agencies. There was wide participation, including the Department of Interior, (U.S. Geological Survey, U.S. Fish and Wildlife Services, and the U.S. Bureau of Reclamation), National Oceanic and Atmospheric Administration (National Weather Service, National Ocean Service, and National Marine Fisheries Service), U.S. Environmental Protection Agency, U.S. Department of Agriculture (Natural Resources Conservation Service and Forest Service), Department of Transportation (Federal Highway Administration and Federal Aviation Administration), Department of Housing and Urban Development, Small Business Administration, Federal Energy Regulatory Commission and the International Boundary and Water Commission.

The Corps provided meeting participants background on the coordination successes FEMA and the Corps have achieved over the past three years under the National Flood Risk Management Program, including 1) coordination between agency leadership through quarterly meetings of the Intergovernmental Flood Risk Management Committee and 2) field level coordination through the Silver Jackets program.

The remainder of the meeting was used for facilitated discussions involving all participants to share their thoughts on areas of potential coordination across Federal agencies.

Participants all agreed to continue staff-level coordination meetings to focus in on high priority coordination issues.

Additionally, the Corps is seeking partnerships with those in the private sector that best understand risk, such as banking and insurance industries to share data and risk model development. An opportunity exists for the Federal Government and insurance industry to leverage mutual efforts, such as in the areas of research and development, implementation of assessment tools, and increase of public and policy-maker awareness. We wish to collaborate more closely with business councils and developers so they understand local flood risks, and can assist us in public education campaigns.

### **Midwest Actions**

Over the past three years, through the IFRMC, the Silver Jackets Program, and periodic regional coordination meetings, the Corps and FEMA have succeeded in building strong, working relationships between our agencies, both at the top levels in Washington as well as in the field at FEMA regions and Corps districts. The Corps and FEMA are now also working to establish the same type of working relationships with other Federal partners, such as the National Oceanic and Atmospheric Administration and the United States Geological Survey.

Now is the time to make use of these relationships to be sure that a unified response is provided to the Midwest flooding that not only meets the immediate emergency response needs, but also lays the ground work for long term recovery efforts that result in an informed approach to future flood risk management for the region.

Some initiatives include:

- Establishing an Interagency Levee Task Force for the 2008 Midwest Floods in accordance with a February 18, 1997 directive from the Office of Management and Budget to ensure that agencies fully consider relevant options, including non-structural alternatives, during evaluation and review of levee repair and reconstruction projects. In that regard, the Midwest Floods of June 2008 present another opportunity for the impacted Federal, State and local governments to address a rapid and effective response to damaged flood and floodplain management systems that will minimize future risk to life and property, while ensuring an effective interagency approach to flood damage mitigation and floodplain management, including opportunities for non-structural alternatives, in a collaborative manner.
- Coordinate post-flood assessment efforts among FEMA, Corps, the National Weather Service (NWS) and U.S. Geological Survey (USGS) to avoid unnecessary duplication of effort and to ensure that data quality standards are met in the collection process.
- Where warranted, consider both floodwater management and floodplain management options beyond the limited levee rehabilitations authorized under PL 84-99, to address flood risk reduction needs.

- Present a common federal voice in conveying flood risk information and to send a clear message to the American public about the realities of residual risk and the responsibility they hold to make wise decisions in floodplains during their long term recovery efforts.

In summary, responsibility for flood risk management in the United States is shared between multiple Federal, State, and local government agencies who must all work together to effectively address these complex issues. Madam Chair, this concludes my testimony. I would be happy to answer any questions you or other members of the Committee may have.

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Questions to Secretary Woodley

Senator James M. Inhofe (R-OK)

1a. Secretary Woodley, could you please clarify whether the Corps of Engineers and the Administration make any distinctions between establishing an inventory of levees and performing either inspections or assessments of levees? If so, what is meant by each term?

Answer: The Corps of Engineers (USACE) and the Administration do make a distinction between each of these activities.

Inventory of levees – a living database, known as the National Levee Database (NLD), of information relative to the status and condition of the nation's levee systems. The database includes all necessary attributes of levees/floodwalls relevant to design, construction, operations, maintenance, repair, and inspections. The inventory will serve as a national source of information to facilitate and link activities, which include flood risk communication, levee certification, levee inspection, floodplain management, and risk assessments.

Inspections – For levees there are two types of inspections,

- Routine Inspections - to verify proper operation and maintenance activities through visual observations, typically to be conducted on an annual basis.
- Periodic Inspections - to verify proper operation and maintenance through visual observations; evaluate operational adequacy and structural stability by a comparison of design criteria at the time of construction with current design standards; and, identify components and features to monitor over time. Typically to be conducted every five years.

Assessments – For levees there are two levels of assessments,

- Periodic Assessments - a combination of a Periodic Inspection and potential failure mode and consequences analysis used for initial screening and prioritization of Risk Assessments. Interval to-be-determined.
- Risk Assessments – a process of identifying the likelihood and consequences of levee failure to provide the basis for informed decisions on a course of action. Interval to-be-determined.

b. Current authorization is for which of those activities?

Answer: Under PL 84-99 (33 U.S.C 701n), USACE is authorized to undertake activities, including disaster preparedness, advance measures, emergency operations, and rehabilitation of flood control works (FCW) threatened or destroyed by flood. Under the authority of PL 84-99, the USACE Rehabilitation and Inspection Program (RIP) provides for the inspection and rehabilitation of Federal and non-Federal flood damage reduction projects to ensure continuation of reliable flood damage reduction and for projects with a

Federal investment, to ensure that local sponsors are fulfilling requirements outlined in project cooperation agreements.

In addition, 33 CFR 203.42, 33 CFR 203.43, and 33 CFR 208.10 outline the requirements for inspection of Federal and non-Federal "flood control works."

Although never funded, under RIP, there is a provision for each USACE district to maintain a database of all FCW within their area of responsibility. In FY 2006 Flood Control and Coastal Emergencies (FCCE) 3<sup>rd</sup> Supplemental Bill, USACE receive \$30 million dollars to create a national levee inventory and assessment methodology.

USACE has the authority to perform these activities on levees which are linked to USACE.

These include,

1. Levees which are operated and maintained by USACE.
2. Levees designed and built by USACE, but are turned over to a non-Federal sponsor for operations and maintenance.
3. Levees not designed and build by USACE, but are authorized to be part of the USACE Federal system.
4. Non-Federal levees which have been accepted into the USACE Rehabilitation and Inspection Program.

c. How is that work being prioritized?

Answer: For all levees in the RIP, USACE performs routine inspections on an annual basis.

Beginning in FY2009, USACE will begin periodic inspections of up to 20% of miles of Federally authorized levees in the USACE RIP.

For the inventory work, USACE is initially focusing on levees it operates and maintains and those Federally authorized levees in the RIP. For these levees, by the end FY 2008, USACE will have collected and uploaded detailed information into the National Levee Database totally 9800 miles. In FY 2009, USACE will continue collecting detailed information for the remaining levees in RIP. Also in FY2009, USACE plans to apply a screening assessment to all levees in the NLD in order to begin assessing associated relative risk and prioritize levee safety activities.

d. Are there estimates for how much it would cost ,to expand current authorization for the logical increments, such as expanding either the categories of levees addressed or expanding the level of detail looked at for the various categories of levees that are or might be covered?

Unfortunately, we still do not know how many miles of levees exist throughout the nation. Up until now, USACE did not have the authority to collect information or inspect

levees outside a USACE program, such as levees operated and maintained by other Federal agencies like the Bureau of Reclamation or state owned levees. The National Levee Safety Act of 2007 (the Act) takes us one step closer. The Act provides USACE the authority to inspect and collect information for all Federal levees, in addition to, working with the states to collect information they provide for non-USACE program levees. However, additional funding would be needed to fully implement this provision of the Act.

2. During this flood event, did the Corps of Engineers encounter any difficulties in providing the best possible emergency preparedness and response assistance due to statutory constraints? If so, how would you recommend those issues be resolved?

Answer: No statutory constraints that prevented an effective response. PL 84-99 (33 U.S.C 701n), provides sufficient authorization to undertake necessary activities, including disaster preparedness, advance measures, emergency operations, and rehabilitation of flood control works (FCW) threatened or destroyed by flood. During this flood event the Corps was able to provide both technical assistance to states and communities threatened by flood and direct assistance by providing flood fight supplies, equipment and emergency contracting. Additionally, emergency repairs are underway for eligible flood damage reduction projects damaged by the recent flooding.

Senator John Barrasso (R-WY)

1) In 2005, a locally built and maintained levee in Diamondville, Wyoming, became unstable during a flood on the Hams Fork of the Green River. The U.S. Army Corps of Engineers in Sacramento, California, was contacted for guidance on levee stabilization.

After the event, the Corps has been asked by the Wyoming Department of Homeland Security if they can help Diamondville rebuild the levee to offer flood protection. Could you possibly provide a written response to my office as to what assistance you can provide Diamondville in this regard?

Answer: The locally built and maintained levee in Diamondville, Wyoming, was found not to be part of the US Army Corps of Engineers Rehabilitation and Inspection Program (RIP). The Corps of Engineers Sacramento District was able to offer flood fighting assistance during a flood event in Diamondville but could not offer any assistance after the flood fighting event. In the past, the Corps of Engineers has inspected the levee in Diamondville as part of an Initial Eligibility Inspection (IEI), and found that the levee system was not complete, and does not fully protect the area so levee was not eligible for the RIP. If there have been additions to the levee system since the Corps' original inspection, and if requested by the city of Diamondville, the Corps will conduct another IEI and re-consider the system.

2) Some of these levees in Wyoming are Corps built but locally owned. Others are locally owned and operated. They need assistance to ensure that these levees are up to par. Is there any federal assistance out there 'for them?

Answer: There are no federally constructed levees in Southeastern Wyoming, which encompasses Sacramento District area of responsibility. In the North and eastern area of Wyoming there are two federally constructed flood protection project's in Omaha District's Area of Responsibility. The two federally constructed projects currently in the PL84-99 program are located at Grey Bull and Sheridan. The Jackson Hole Flood Reduction Project, is located in Western Wyoming near Jackson, is Federally constructed and is jointly operated and maintained by Teton County and the U.S. Army Corps of Engineers operation and maintenance program. There is also a nonfederal locally sponsored flood reduction project in the Rehabilitation and Inspection Program (RIP) that is located in Teton County, referred as the Black Rock Flood Reduction Project. Both of these projects encompass Walla Walla District's area of responsibility.

If a non-federal levee sponsor is interested in potentially being considered for the Rehabilitation and Inspection Program, they should contact the District to request an initial eligibility inspection (IEI). If the levee has been constructed to USACE standards and is properly maintained and operated the levee will be granted entrance into the program. To remain in the program, the levee must continue to meet USACE standards on an annual basis. If the flood protection project is damaged during a flood event and in an active status, the levee may be repaired to it's original condition with a 80% Federal/20% Public Sponsor cost share.

The U.S. Army Corps of Engineers has recently established a Levee Safety Program which is part of a comprehensive approach for sustainable national flood risk management to improve public safety and reduce flood damages. The Levee Safety Program applies to all completed flood damage reduction systems including levees, channels, floodwalls, and hurricane and shore protection systems that are operated and maintained by the USACE, Federally authorized projects in the Inspection of Completed Works Program, and non-Federal projects in the RIP.

Senator BOXER. Thank you very much, Mr. Woodley.  
Brigadier General Walsh, welcome.

**STATEMENT OF BRIGADIER GENERAL MICHAEL J. WALSH,  
COMMANDING GENERAL, U.S. ARMY ENGINEER DIVISION,  
MISSISSIPPI VALLEY**

General WALSH. Madam Chair and members of the Committee, I am honored to appear before you today and report on the response of the Corps of Engineers Mississippi Valley Division during the Midwest flood event on the Mississippi in June 2008.

My testimony addresses both the response of the extensive flooding in the Midwest area as well as how we continue to support and provide assistance to the people of this region in the recovery efforts from this significant event. The Corps' first concern is always to ensure the safety of U.S. citizens. We cannot stress enough that each and every citizen should maintain situational awareness of current and future flood events, stay in touch with the latest updates and warnings, particularly with the changing weather and river conditions as monitored and forecast by the National Weather Service; have evacuation plans prepared and implemented and stay away from flooded areas and moving waters unless involved with the flood fight effort.

In March of this year, the focus of the Corps' flood response efforts was centered on the lower Mississippi River from Arkansas to Tennessee down to the Gulf of Mexico. In June, our focus shifted to the middle and upper reaches of the Mississippi and its tributaries, where extensive flooding, in some locations record-setting flooding, occurred. Many Mississippi River tributaries, including in the Cedar, Des Moines and Iowa Rivers, reached record and near-record stages. The climate conditions early this spring led to continuous weather systems moving through the middle section of our Country. These systems resulted in rainfall amounts twice the normal level for that time of year.

This record rainfall led to rivers and streams not only being filled to capacity, but in numerous locations causing over-bank flooding. The magnitude of the Midwest flood event of 2008 adversely impacted and continues to impact areas along the Mississippi River and its tributaries from Wisconsin and Minnesota to Arkansas and Tennessee. The Cedar River set new record stages, reaching 6 feet above the 1999 record stage at Cedar Falls, Iowa, and reaching 11 feet above previous records at Cedar Rapids, Iowa. The Iowa River in Iowa City, Iowa, crested at three feet above the 1993 record stage, flooding facilities in the University of Iowa campus as well as other areas in the city.

Record stages were set in over 47 gauge stations on more than 12 tributary rivers and creeks. The Mississippi River set new record stages at Keithsburg and Gladstone, Illinois, and Burlington, Iowa and approached record stages in many areas. Within the Mississippi Valley Division, specifically in the Rock Island and St. Louis Districts, a total of 19 non-Federal levee projects and 6 Federal levee projects, all under the Public Law 84-99 program, were over-topped along the Mississippi River and in the Iowa and Turkey River basins. However, of the 200 levee projects in the 84-99 program in those two districts, 175 did not over-top.

The locks at the locks and dams from 12 to 25 on the Mississippi and the Calcasieu River were taken out of operation, as flood waters over-topped the facilities, closing navigation to a major reach of the upper Mississippi River. In response to these historic flood events in the Midwest, reservoirs were operated in accordance with their established water control manuals.

In addition, the Corps responded through emergency support to State and local governments as well as through mission assignments from the Federal Emergency Management Agency, FEMA. Emergency operations centers responded to a variety of flood-fighting activities on a continuous basis from our district offices in St. Paul, Rock Island, St. Louis and Memphis Districts.

The Corps also provided assistance to State and local governments through our own authorities, as well as through the mission assignments from FEMA. These missions included emergency response, technical assistance for all phases of debris management, inspection of water and water treatment systems. We assisted in the assessment of temporary housing needs and conducted assessments for the provision of temporary emergency power through the deployment of our 249th Engineer Battalion and provided support for the power needs of critical facilities, including the University of Iowa hospital.

Approximately 1.7 million liters of drinking water were provided to the State of Iowa, as well as critical public facility assistance and engineering design for repair and restoration of public schools. At the peak, there were 239 personnel engaged in providing flood-fighting assistance. Approximately 13 million sand bags, 100 pumps, 3,000 rolls of polyethylene sheeting were provided to support the local and State efforts.

I visited many of these impacted areas on several occasions, and I have had the opportunity to talk to a lot of people and see the efforts put forth to control the situation. I also had visited the Sny Island Levee District in Illinois and watched at least 10 bulldozers continuing to push sand back up onto the levee to bolster the fight, to meet the predicted event. This example shows how the citizens of the regions responded heroically to the difficult challenges in these past few months.

The U.S. Army Corps of Engineers will coordinate an interagency levee task force, comprised of Federal, State and local agencies whose purpose is to conduct a regionally coordinated assessment of flood risk management systems in the areas affected by the 2008 flood. The task force will offer an opportunity for all participating agencies to address a rapid and effective response to damaged flood systems that will minimize future risk to life and property while ensuring an effective inter-agency approach to flood damage mitigation, including opportunities for non-structural alternatives in a collaborative manner.

Activities are currently underway to assess damages to flood damage reduction projects that are actively enrolled in the Corps' rehabilitation and inspection program, leading to the subsequent repair of those projects. As accurate rainfall and river forecasts are vital to the protection of human life, property and business operations as the 2008 floods, reemphasized, we will also put together a rainfall and river forecasting summit with Federal agencies,

State and local government entities and commercial interests and the public. This is planned for the October timeframe to determine what went right, what went wrong and what can be improved in the river forecasting process.

The recent Supplemental Appropriations Act provided \$600 million for the Corps to address multiple recent natural disasters, including the flooding in the Midwest. The Corps will continue to work with our partners in the Federal, State and local agencies to repair flood risk management infrastructure as well as explore other means for reducing the risks of future flooding.

Again, thank you for allowing me to testify here today, Madam Chair. This concludes my testimony.

[The prepared statement of General Walsh follows:]



**DEPARTMENT OF THE ARMY  
U.S. ARMY CORPS OF ENGINEERS**

**STATEMENT OF**

**BRIGADIER GENERAL MICHAEL J. WALSH  
DIVISION COMMANDER  
MISSISSIPPI VALLEY DIVISION**

**BEFORE THE**

**ENVIRONMENT AND PUBLIC WORKS COMMITTEE  
UNITED STATES SENATE**

**ON**

**THE MIDWEST FLOOD OF 2008**

**JULY 23, 2008**

Madam Chair and Members of the Committee, I am honored to appear before you today to report on the response of the U.S. Army Corps of Engineers, Mississippi Valley Division during the Midwest flood event in the Mississippi Valley during June 2008. My testimony addresses both the response to the extensive flooding in the Midwest area as well as how we will continue to support and provide assistance to the people of this region in the recovery efforts from this significant event.

The Corps' first concern is always to ensure the safety of U.S. citizens and we cannot stress enough that each and every citizen should maintain situational awareness of current and future flood events, stay in touch for the latest updates and warnings, particularly the changing weather and river conditions as monitored and forecast by the National Weather Service, have evacuation plans prepared and implemented, and to stay away from flooded areas and moving water, unless involved in the flood fight effort.

In March of this year, the focus of the Corps' flood response efforts was centered along the lower Mississippi River, from Arkansas and Tennessee to the Gulf of Mexico. In June, our focus shifted to the middle and upper reaches of the Mississippi River and its tributaries, where extensive flooding - in some locations record setting flooding - occurred. Many Mississippi River tributaries, including the Cedar, Des Moines, and Iowa Rivers reached record, or near record, stages. The climate conditions early this spring led to continuous weather systems moving through the middle section of the country. These systems resulted in rainfall amounts up to twice the normal level for that time of year. This record

rainfall led to rivers and streams not only being filled to capacity, but in numerous locations, caused over-bank flooding.

The magnitude of the Midwest flood event of 2008 adversely impacted, and continues to impact, areas along the Mississippi River and its tributaries from Wisconsin and Minnesota to Arkansas and Tennessee. The Cedar River set new record stages, reaching six feet above the 1999 record stage at Cedar Falls, Iowa, and reaching eleven feet above the previous record at Cedar Rapids, Iowa. The Iowa River at Iowa City, Iowa, crested at three feet above the 1993 record stage, flooding facilities on the University of Iowa campus as well as other areas of the city. Record stages were set at over 47 gage stations on more than 12 tributary rivers and creeks. The Mississippi River set new record stages at Keithsburg and Gladstone, Illinois and Burlington, Iowa, and approached record stages at many more. Within the Mississippi Valley Division, specifically in the Rock Island and St. Louis Districts, a total of 19 non-Federal levee projects and six Federal levee projects, all under the USACE PL 84-99 Program, were overtopped along the Mississippi River, and in the Iowa and Turkey River basins. However, of the 200 levee projects in the PL 84-99 Program in those two districts, 175 were not overtopped. Locks at Lock and Dams 12 to 25 on the Mississippi River and Kaskaskia Lock on the Kaskaskia River were taken out of operation as flood waters overtopped the facilities, closing navigation in a major reach of the Upper Mississippi River.

In response to this historic flood event in the Midwest, reservoirs were operated in accordance with established water control manuals. In addition, the

Corps responded through emergency support to state and local governments (pursuant to PL 84-99), as well as through mission assignments from the Federal Emergency Management Agency (FEMA). Emergency Operations Centers responded through a variety of flood fighting activities on a continuous basis from our District offices in St. Paul, Rock Island, St Louis, and Memphis. The Corps also provided assistance to state and local governments through our own authorities as well as through mission assignment from FEMA. These missions included emergency response, technical assistance for all phases of debris management, and inspection of water and wastewater treatment systems. We assisted in the assessment of temporary housing needs, conducted assessments for provision of temporary emergency power, and through deployment of the 249<sup>th</sup> Engineer Battalion provided support for the power needs of critical facilities, including the University of Iowa Hospital. Approximately 1.7 million liters of drinking water was provided to the State of Iowa as well as critical public facility assistance in engineering design for repair and restoration of public schools. At the peak, there were 239 personnel engaged in providing flood fight assistance. Approximately 13 million sandbags, 100 pumps, and 3 thousand rolls of polyethylene sheeting were provided in support of local and State efforts.

I visited these impacted areas on several occasions and had the opportunity to talk to people and see examples of the effort put forth to control the situation. In a visit to the Sny Island Levee Drainage District in Illinois, I watched as ten bulldozers pushed sand up on levees to bolster them in the fight

to meet the predicted event. This example shows how the citizens of this region responded heroically to a difficult challenge over these past months.

The U.S. Army Corps of Engineers will coordinate an Interagency Levee Task Force, comprising other Federal, State and local agencies, whose purpose is to conduct a regionally coordinated assessment of flood risk management systems in the areas affected by the 2008 flood. This task force will offer an opportunity for all participating agencies to address a rapid and effective response to damaged flood systems that will minimize future risk to life and property, while ensuring an effective interagency approach to flood damage mitigation, including opportunities for non-structural alternatives, in a collaborative manner.

Activities are currently underway to assess damages to flood damage reduction projects that are actively enrolled in the Corps Rehabilitation and Inspection Program, leading to subsequent repair of those projects. As accurate rainfall and river forecasts are vital for the protection of human life, property, and business operations as the 2008 floods reemphasized, a Rainfall/River Forecasting Summit with Federal agencies, State and local government entities, commercial interests, and the public is planned for early October to determine what went right, what went wrong, and what can be improved in the forecasting process.

The recent Supplemental Appropriations Act (Public Law 110-252), provided almost \$606 million for the Corps to address multiple recent natural disasters, including the flooding in the Midwest. The Corps will continue to work

with our partners in Federal, State and local agencies to repair flood risk management infrastructure, as well as explore other means of reducing the risks of future flooding.

Again, thank you for allowing me to testify here today. Madam Chair, this concludes my testimony. I would be happy to answer any questions you may have.

Questions to BG Walsh

Senator James M. Inhofe (R-OK)

1. During this flood event, did the Corps of Engineers encounter any difficulties in providing the best possible emergency preparedness and response assistance due to statutory constraints? If so, how would you recommend those issues be resolved?

Answer: No statutory constraints that prevented an effective response. PL 84-99 (33 U.S.C 701n), provides sufficient authorization to undertake necessary activities, including disaster preparedness, advance measures, emergency operations, and rehabilitation of flood control works (FCW) threatened or destroyed by flood. During this flood event the Corps was able to provide both technical assistance to states and communities threatened by flood and direct assistance by providing flood fight supplies, equipment and emergency contracting. Additionally, emergency repairs are underway for eligible flood damage reduction projects damaged by the recent flooding.

Senator John Barrasso (R-WY)

1) In 2005, a locally built and maintained levee in Diamondville, Wyoming, became unstable during a flood on the Hams Fork of the Green River. The U.S. Army Corps of Engineers in Sacramento, California, was contacted for guidance on levee stabilization.

After the event, the Corps has been asked by the Wyoming Department of Homeland Security if they can help Diamondville rebuild the levee to offer flood protection. Could you possibly provide a written response to my office as to what assistance you can provide Diamondville in this regard?

Answer: The locally built and maintained levee in Diamondville, Wyoming, was found not to be part of the US Army Corps of Engineers Rehabilitation and Inspection Program (RIP). The Corps of Engineers Sacramento District was able to offer flood fighting assistance during a flood event in Diamondville but could not offer any assistance after the flood fighting event. In the past, the Corps of Engineers has inspected the levee in Diamondville as part of an Initial Eligibility Inspection (IEI), and found that the levee system was not complete, and does not fully protect the area so levee was not eligible for the RIP. If there have been additions to the levee system since the Corps' original inspection, and if requested by the city of Diamondville, the Corps will conduct another IEI and re-consider the system.

2) Some of these levees in Wyoming are Corps built but locally owned. Others are locally owned and operated. They need assistance to ensure that these levees are up to par. Is there any federal assistance out there for them?

Answer: There are no federally constructed levees in Southeastern Wyoming, which encompasses Sacramento District area of responsibility. In the North and eastern area of Wyoming there are two federally constructed flood protection project's in Omaha

District's Area of Responsibility. The two federally constructed projects currently in the PL84-99 program are located at Grey Bull and Sheridan. The Jackson Hole Flood Reduction Project, is located in Western Wyoming near Jackson, is Federally constructed and is jointly operated and maintained by Teton County and the U.S. Army Corps of Engineers operation and maintenance program. There is also a nonfederal locally sponsored flood reduction project in the Rehabilitation and Inspection Program (RIP) that is located in Teton County, referred as the Black Rock Flood Reduction Project. Both of these projects encompass Walla Walla District's area of responsibility.

If a non-federal levee sponsor is interested in potentially being considered for the Rehabilitation and Inspection Program, they should contact the District to request an initial eligibility inspection (IEI). If the levee has been constructed to USACE standards and is properly maintained and operated the levee will be granted entrance into the program. To remain in the program, the levee must continue to meet USACE standards on an annual basis. If the flood protection project is damaged during a flood event and in an active status, the levee may be repaired to it's original condition with a 80% Federal/20% Public Sponsor cost share.

The U.S. Army Corps of Engineers has recently established a Levee Safety Program which is part of a comprehensive approach for sustainable national flood risk management to improve public safety and reduce flood damages. The Levee Safety Program applies to all completed flood damage reduction systems including levees, channels, floodwalls, and hurricane and shore protection systems that are operated and maintained by the USACE, Federally authorized projects in the Inspection of Completed Works Program, and non-Federal projects in the RIP.



Senator BOXER. Thank you very much.

Mr. Woodley, as you noted in your testimony, most of the levees that were over-topped were non-Federal levees, levees built and maintained by individual farmers and property owners, or local or State governments. The National Levee Safety Act included in WRDA 2007, which you alluded to, would inventory, inspect and assess levees that fall within the Federal levee program. That would cover a significant amount of the Nation's levees.

However, the program could be expanded to include every levee in the Country, including levees that failed in the Midwest flooding. My question is, would the Corps support that, and what kinds of resources do you believe we would need to make available to make that program work? Whoever would like to address that.

Mr Woodley. Senator, I believe we would support a comprehensive levee assessment, something along the lines of the dam safety programs that we have underway in cooperation with State authorities. I think that the investment required would be very substantial, both Federal and State, although I think that it would not be very large compared to the losses that are suffered.

Senator BOXER. Do you agree with that, Brigadier General?

General WALSH. Yes, ma'am.

Senator BOXER. And do you as well?

General RILEY. Yes, ma'am, of course. And the bill authorizes \$20 million per year to do that inventory. If I may just point—

Senator BOXER. But that is not an inventory for everything. It is just the inventory for—

General RILEY. It does authorize an inventory of more than just the Corps projects.

Senator BOXER. Of every levee in the Country?

General RILEY. Yes, ma'am. The bill authorizes us to—

Senator BOXER. OK, hold on 1 second.

I was told not every levee is covered. But the point is, so you do feel there is enough funding now to do every levee? Because my understanding is you were just doing those levees that fall within the Federal levee program. Am I incorrect in that?

General RILEY. Ma'am, the funding available now is only for what is in the Federal program. If I may refer to the chart just—

Senator BOXER. Before you get off that, I want to be specific. So the funding that you have available to you right now is just for the Federal levees. Did you say it is \$20 million?

General RILEY. We received, in the 2006 supplemental, \$30 million, which began our levee inventory.

Senator BOXER. Good.

General RILEY. And in the latest supplemental this year, we have allocated \$10 million of that supplemental to continue the inventory of the levees in the Federal program.

Senator BOXER. OK, so my question is, how much more would be needed to get everything assessed, all the levees assessed?

General RILEY. I don't have that figure on all of them, but we will get that to you.

Senator BOXER. Mr. Woodley, I would so appreciate it if you could get it. Because you have a lot of friends here who want to see us be more proactive. So if you could get that number to me, that would be very helpful.

Senator BOXER. Yes, ma'am.

Senator BOXER. Did you want to add something? I cut you off, Mr. Riley, so go ahead.

General RILEY. If I could refer to the chart, which shows the total number of levees. Across the bottom of this chart are four general categories. The first category are those that are built and maintained by the Corps of Engineers. There are about 2,100 miles of those, the majority of which are in the lower Mississippi Valley.

The second category are those levees that are built by the Corps and then we turn them over to sponsors to locally operate and maintain. The third category—

Senator BOXER. And how many of those?

General RILEY. That is almost 10,000 miles, 9,650 miles.

The third category are those that are locally built, but we have enrolled them in our rehabilitation and inspection program under Public Law 84-99. And those three categories—

Senator BOXER. And how many of those?

General RILEY. Those are 2,250 miles. So about 14,000 miles in the Federal program, some built by us, some not built by us.

Now, the other—

Senator BOXER. And excuse me for interrupting, because you are educating me. We are talking about here the Midwest or the whole Country?

General RILEY. This is the entire Country.

Senator BOXER. The entire Country.

General RILEY. About 14,000 miles of Federal and non-Federal programs.

Senator BOXER. That is very helpful. I am going to read it back to you. Twenty-one hundred miles are Corps-maintained, 10,000 miles were approximately turned over to locals, the Corps built it, and then 2,250 locally built?

General RILEY. Yes, ma'am.

Senator BOXER. That is very helpful.

General RILEY. And then the last category, the fourth category, is an unknown number of locally built and maintained.

Senator BOXER. I see. What was the 2,250? I thought that was locally built.

General RILEY. That was locally built and we have enrolled them into our Federal program.

Senator BOXER. OK.

General RILEY. The others are locally built, nobody in the Country has a handle on those. But your last bill, the WRDA 2007, authorizes us to inventory all those levees in the Nation. So we are now authorized to do that.

Senator BOXER. OK. So just so I understand, what you are doing now is you are inventorying all the locally built that have not been turned over?

General RILEY. Ma'am, if I could flip to the next chart.

Senator BOXER. Yes, please.

General RILEY. Then I will show you where we stand on our inventory. Of those 14,000 miles of levees in the Federal program, by the end of this year we will have completed a detailed inventory of 9,800 miles of those. So the 14,000 miles we have in the Federal program, we have identified those, they are in the data base. We

have completed a detailed inventory of about 9,800, that will be complete by the end of this year. Those again are the Federal levees.

So we will have to then continue on with the remaining funding to complete detailed inventory of those Federal levees. The detail I speak about, these show the features of the levees that are in the data base, but there are about 200 data fields that go in that fill in all the data. So it is a detailed survey.

So once we complete the 14,000 miles in the Federal program, then we will proceed with all of those other locally built and maintained that really nobody knows how many are out there, because there are many, many private levees.

Senator BOXER. I think it is an excellent move. I wanted to ask, as you build the data base, are you also including in that the, if the levees are strong, if they are weak, if they are problematic, or is that another step?

General RILEY. That is another step. That will fill in all the detailed data of the physical characteristics of the levees. Then we will conduct, in our inspection program, under Public Law 84-99, and as we are funded, we will conduct a portfolio risk assessment. So we have routine annual inspections, we have inspections every 5 years that are periodic. Then the highest risk levees, we will conduct an even more detailed study where we will look at even sub-surface conditions to determine the characteristics and the capability of those levees to withstand any size flood.

Senator BOXER. Major General, can you tell us a timeframe here that you are working off of? Because here is the thing. What I really want to do is start, obviously, as we get the information, have a list, what are the most endangered levees, where do we have to work, where does it not pay to fix the levee, maybe it pays to move folks, maybe it pays to turn it into a flood plain, all these other things. Because we really, in this Committee, we want to do kind of an emergency levee bill to just give you a little more juice as we move forward to get more funding. We know that the appropriators can do it. But if we have an overall bill that identifies the priority.

So where are you on the timeframe here?

General RILEY. Yes, ma'am, on this, of course, the 9,800 miles, by the end of this year, and the rest of the 14,000 miles we will complete in the next 2 years after that. That is in the Federal program. Then we will also, in 2 years, begin risk assessments on those levees to determine which ones are the greater risk.

Now, at the end of this year, we will have this website with all this data on it. It will be accessible to the public. All the data won't be accessible, because we will have to restrict some of it. But it will be accessible of course to the Corps, FEMA, and then other Federal, State and local agencies that work in that program. We will begin next year to make those priority choices of which ones are at the highest risk.

Senator BOXER. Let me ask you this, and anyone can answer it. Could we speed up that program if we gave you, if we made it a Manhattan Project, if we just said, look, at the rate these storms are coming, we need to move quicker? So is there a way, if we were to, I am not asking your opinion whether we should or shouldn't, because that is our decision. But if you were able to, say, get dou-

ble the funding, could you double the time in which this could be done?

General RILEY. Ma'am, I think the best way to approach that is through your WRDA bill you authorized a national levee safety committee. Our Director of Civil Works is here. He is the chair of that committee. Mr. Woodley has directed that committee now be stood up. Your bill requires within 180 days that they come back to you and Mr. Woodley and then the Congress with a national strategy. So that has to be done in less than 6 months from now.

I think that committee, which include representatives from all over the Nation, external to the Corps, chaired by our director, will provide you a good analysis of that.

Senator BOXER. Of where we go from there. So Mr. Woodley, if in 6 months you are ready, you would be able to tell me at that time whether or not additional funding would be able to move this process along, is that right?

Mr Woodley. Yes.

Senator BOXER. OK. Well, I look forward to that.

Mr. Woodley, Carl Strock, former Chief of Engineers of the Army Corps, has testified about the value of wetlands in helping to prevent and mitigate funding. Chief Van Antwerp similarly testified to their benefits. In the upper Mississippi River basin, there has been considerable wetland loss in many of the affected States. Iowa has lost 89 percent, Illinois 85, Missouri 87 percent. Do you believe this loss of wetlands may have helped contribute to these regular devastating floods in the region? And are there any policies you could support that could help turn that wetlands loss around?

Mr Woodley. Senator, I am quite confident that loss of wetlands nationwide has altered hydrologies in ways that make the severity of floods greater than they otherwise might have been. Now, when a flood is 11 feet above the historic figure, it is hard to say that there would not have been a flood in that location regardless. But this is one of the prime reasons for our national policy of restoration of the Nation's wetlands. Of course, our regulatory program seeks to protect existing wetlands, and we have also embarked on a policy or a planning process in the Upper Mississippi to engage in a number of aspects of ecosystem restoration on the Upper Mississippi and its tributaries that I believe, in, the planning process and we should be able, or I hope to be able to make a recommendation to Congress very soon.

Senator BOXER. Good.

Mr Woodley. The other thing that I would mention in this context is the very strong provisions in the Farm Bill that are available for farmers to devote parts of their appropriate land, on a voluntary basis, for wetlands restoration and preservation.

Senator BOXER. I fought for that one.

Mr Woodley. It is a very important policy.

Senator BOXER. It is. From my own experience, when I first got involved with the Army Corps, it was so many years ago. In those years, it was before I even got to the Congress, it was in local government in the 1970's. The Corps thought, concrete channel, concrete channel, that was basically the mind set, how do you get that water fast, we move it out. Then through the years, I have watched with just great relief as the Corps has embraced these other kinds

of strategies to allow the water to spread out and go slower and so forth. Certainly, in my experience in California, those wetlands are just a tremendous addition to any flood control that we are going to do.

So I look forward to that. I think, again, a lot of the times, you are put in a difficult position. What we need from you is just not, you should do this, but if you were to be able to restore wetlands, it would mean X, it would mean Y. These are the things we need from you, and then we have to make a policy choice.

Mr. Woodley, are you aware of the findings in a recent report released by the U.S. Climate Change Science Program, in cooperation with NOAA, titled Weather and Climate Extremes in a Changing Climate? This study shows that the last few decades have brought more heavy summer rainfall, especially to the central United States. This trend toward heavier precipitation is caused by global warming primarily, because warmer air can hold more moisture.

This report projects that the trend toward heavy precipitation will continue. For example, those big storms in the Midwest that historically would be seen once every 20 years could happen once every 5 years by the end of the 21st century. How is the Army Corps taking into account this latest science indicating a trend toward heavier rainfall events in the future and the implications for flood management?

Mr Woodley. Senator, we are examining climate change aspects within our organization through our Institute of Water Resources, which is our policy institute that is engaged in that sort of thing and that follows that very closely. In fact, it is something that they are very proud of, that organization that deals with that on an international scale actually won a Nobel Prize last year. One of the members of the organization is a staffer at our Institute of Water Resources. I was there last week, and they have put his Nobel Prize on the wall there. They are very, very proud of it.

So we are keeping very close tabs on the science of climate change, and I believe I am going to be seeing a draft white paper on the engineering aspects of climate change. It is mainly something that would affect us within our own program in the projections that we make and the risk assessments that we make. We are transitioning to consider these aspects as aspects of risk and we are recognizing the practical impossibility of absolute protection. I visited Cedar Rapids and the people there are, I would encourage anyone who wanted to see the human spirit at its most noble to visit Cedar Rapids and see the way that people are coping with it.

But the thing that I saw, in the work that I do, I would say engineering is probably not going to prevent or protect against a flood that is 11 feet above any experience we have had before. But we need to express the risks to people, what are your risks. And the other thing about a levee is that levees are just human structures, they will be over-topped, they will fail, they will develop weaknesses, animals will burrow into them, every kind of thing can happen to a levee. It is a very fragile structure, and it holds back an enormous force of nature.

At any rate, that is a long way of saying that we are very much following the matters that you describe and continuing to use them

in a very dynamic way to inform the recommendations that we make to Congress.

Senator BOXER. Mr. Woodley, I found that testimony to be extremely straightforward, and I appreciate it. I am going to say it back to you and see if I heard you right.

When I asked you, and I think this would be interesting for Senator Carper, whether or not the Corps was taking into account global warming in its projections of what they have to do and what people have to expect, Mr. Woodley basically said, we can't promise absolute protection, because of the way these storms are coming. And I think that is an important point for all of us to hear. Because unless we build, I don't know what, fortresses around our cities, this is a problem. And this isn't your job, it is ours. We need to get a handle on this global warming and we need to do something so that 25 years from now, with other people sitting here, of course, Tom will still be here, 25, 30, 40 years from now, and who knows, Mr. Woodley, you have proven yourself to be, you have been around a while. So you might be here.

And when somebody says, oh, my God, what can you do? And we are not going to be able to give them a good answer unless we today, and it isn't you, it is us, and it is a future President, takes strong action to make sure that the temperatures don't go up 3, 4, 5, 6 degrees average temperatures. Because you are already saying it is getting problematic. I appreciate that. Because I will tell you, when I was a kid growing up, we thought, no problem, we can master this. And you know what? So far, we have. But if we can't get a handle on global warming and reverse what could happen in the worst of circumstances, I don't know that levees are going to matter that much.

But I do have a question for General Walsh. Of the Federal levees that were over-topped, how many of these levees remain structurally sound, and how many will need substantial structural work to once again operate at a functioning level? I was really glad that they held pretty well. But how many were over-topped? Do we know?

General WALSH.

[Off microphone.] There were six Federal levees that were over-topped.

Senator BOXER. Could you make sure you turn on your microphone?

General WALSH. Madam Chair, there were six Federal levees that were over-topped in the area. Two of them were rated at a 100 year level of protection, three were at 50 years. We really need to wait until the flood waters go down some more and damage survey repair teams will go out. Then we will write up project information reports, and then fund them and go into the repair process.

Senator BOXER. Good. So this is interesting. You said two were 100 year?

General WALSH. Two were rated at a 100 year level of protection.

Senator BOXER. And those were breached?

General WALSH. And three were 50 year.

Senator BOXER. Wow. And 100 year is the biggest that we aim for, right? The biggest flood that we try to protect from?

General WALSH. That is where we start, FEMA works their insurance piece. But there are 500 year levees and even higher.

Senator BOXER. There are 500 year, OK.

General WALSH. Yes, ma'am, and if I may?

Senator BOXER. Please.

General WALSH. For any of those, any system that we take a look at, we make an assessment based on the risk and will design a levee based on the reduction of risk in that area. It may be at any level of protection. And 100 year only refers to FEMA's protection for the National Flood Insurance Program.

Senator BOXER. Do you work with private insurers ever just to find out what they are doing in some of these flood-prone areas? Mr. Woodley, do you ever talk to them about it? Because we have heard stories that private insurers are not coming in to some of these areas.

Mr Woodley. Senator, I am not aware of any direct interaction we have with them on particular cases. I believe that we have been consulting with the trade groups and representatives of the industry as a whole in understanding and getting a better understanding on our own part of risk management and the tools that they use in their business for risk management and how to express it. Because that is a tremendous challenge for us right now.

Senator BOXER. I have one last question, then I am going to turn the gavel over to Senator Carper to run the rest of the hearing as he sees fit. This is to Mr. Woodley.

In 1993, devastating floods hit much of the same region that was hit this year. Following the Midwest flood of 1993, President Clinton chartered the U.S. Interagency Task Force on Flood Plain Management, headed by General George Galloway of the Corps. He wrote the Galloway Report. The report argued that the responsibility for flood plain management needed to be more clearly defined among Federal, State, tribal and local governments. The report also acknowledged the critical ecological services, such as nutrient and water uptake provided by wetlands and upland forests. It noted that loss of wetlands significantly increased runoff, contributing to an area's susceptibility to flooding.

Are you familiar with this report, and can you tell us the status of those recommendations, how many were implemented and how many still remain to be implemented?

Mr Woodley. I certainly am, and I am very familiar with General Galloway as well, who is, I think, one of the Nation's premier experts on flood risk policy. We consult with him all the time. I believe the answer is that many of the recommendations have been partially implemented, a few have been fully implemented. I think to the extent they have been implemented the effects of this year's flooding have been ameliorated. There are some aspects of the report that we are still working our way toward as a Nation. And some of them have not been fully taken to heart.

But I believe that the recommendations of that report remain valid and that we can see, to the extent that they have been implemented, that the effects of the subsequent flooding have been ameliorated.

Senator BOXER. Here is the thing. I haven't read it. But would you commit to me that the Corps would take a review of the 1993

task force report to either reaffirm its recommendations or put forward new ideas? I think a lot of times, we have a crisis and we write a report. And this one, here it is. This is the summary. And I am sure there are some things in there that you would want to do and some things you wouldn't.

Would you commit to me that you would do a thorough review of this report and get it to me as to which recommendations you think still have merit, which ones have been done? I mean, this is 1993. So if you would make that commitment?

Mr Woodley. Senator, I will do something better than that. I will task the Levee Safety Committee that the Congress created in the last WRDA bill to make that their first order of business.

Senator BOXER. That would be wonderful. I think that is great. Because it may be that there are six or eight or ten or five things in there that we just didn't do. And there is nothing about blame. It is the nature of humanity, we have so many things on our plate.

But I think if you could do that, I am just thrilled with that answer, and I really look forward to going over that with you. When you get that done, please come see me and we will take a look at it. It may make the job of your task force a little easier, because maybe half the things that we need to do are already detailed in that report. That would be good. And we can move faster.

So with that, let me just say to all of you, I thank you very much for being here today. We are on the same team on this. The main thing I need from you is your honest appraisals. I think I have gotten that today. That is all I can ask you for. Then the rest is up to us. So if you just give us your opinion and then we will make the policy decisions, that is all I ask. I do hope and pray that we don't have to have a lot of these hearings after the fact.

But I am a realist, like you are, Mr. Woodley, and we are in this difficult moment, for whatever reason. The main thing we need to do is prevent as much as we can, much of this from happening. Then when something does happen, respond quickly and do the mitigation after the fact. And whatever that mitigation is, we have to be honest. And you were very honest today and I really appreciate that.

So I will turn the gavel over to my dear friend, such a great member of this Committee, Senator Carper.

Senator CARPER.

[Presiding] Thank you, Madam Chair. Thank you for your leadership and thank you for turning that gavel over to me. We will be finished here in about 3 hours.

[Laughter.]

Senator CARPER. It may feel like 3 hours, but it won't be long at all.

First of all, it is good to see you all. Thank you for coming and thank you for your stewardship and for your leadership on issues that are important to us, whether they are happening on the west coast, in California, where I used to live, before I moved to Delaware on the east coast, to find my fame and fortune. Well, actually, my fame, not my fortune.

Every now and then, I run into people who say, well, I live in an area where it is described as a 100 year flood zone or maybe a 500 year flood zone. And people say, well, particularly in one



place in northern Delaware where we had literally twice in about a 5-year period of time 100 year floods, and so probably after the first time it happened, people said, well, we are good for another 100 years. It turned out we weren't. But sometimes the term 100 year flood or 500 year flood is misleading. I have seen it with my own eyes and heard with my own ears how misleading that can be.

But telling people that they have a 1 percent chance, that would be like a 100 year flood situation, or a 0.2 percent chance of flooding, which would relate to a 500 year flood, telling them that those are their chances of being flooded in a year can also be misleading. Let me just ask how you think we can maybe better communicate to Americans living in high risk areas the flood risks that they do face?

Mr Woodley. Senator, you have put your finger right on the biggest communication issue and difficulty we have in this whole arena. And we are, as we speak, creating a new vocabulary for communication of risk. And it is——

Senator CARPER. Can you tell us a little bit about it?

Mr Woodley. Actually, I think General Riley probably could describe it in more understandable terms than I can. It is not ready to be released, and it is something that we are wrestling with within the Federal family and also with the State agencies. There are two major groups that embody the State actors on this, NAFSMA, which is the National Association of Flood and Storm Management Agencies, and the Association of State Flood Plain Managers. They are actively working with us on this. And NOAA needs to be involved in it. But I am going to ask General Riley to describe the way we are going to be trying to communicate these risks in the future.

Senator CARPER. Good, thanks, if you would do that, General Riley, that would be great.

General RILEY. Yes, sir. Then we might even hear more specifics by General Walsh on how well New Orleans has accepted it. But probably our first example was in New Orleans. Also, we had some dams at risk at Wolf Creek and Center Hill, California, as well. Those were in Tennessee, and then in California. We have used the same sort of methodology. We found that in New Orleans in particular it took a great deal of modeling and sophistication, but we articulated the risks through inundation maps. You are able to now go onto Google, type in your address, go right to your home, and it says, if you live there, you have a risk every year of being flooded to this depth, two, three, four feet, or no feet if you are on a little bit higher ground.

We have found that to be the most effective way to convince people. That is the risk every year from all storms, including rainfall, not just hurricanes.

So we tried to get away from the terminology of percent, although it is difficult to get away from that, so we still use that. But we say, you can expect this depth every year from any type of storm to a certain percent, whether it be the 1 percent chance every year. Then we compared that 1 percent chance to some other event in their life that they can compare that to.

Senator CARPER. Such as what?

General RILEY. Well, such as the risk of crossing the street or the risk of flying, is probably an easier one, because they have those statistics available. So the comparative risk methodology is quite a body of knowledge. We are not all experts on it, but as Senator Boxer asked earlier about the insurance, we have partnered with the auto insurance agencies to help us be able to articulate risk, because they do that very, very well, and for a living.

Senator CARPER. Good, thanks. You guys are ahead of the curve on that one.

I have one more issue I want to touch on. I serve on a couple other committees, some of which are meeting right now. One of those committees is the Banking Committee. Before I was Governor, I served on the House Banking Committee. About 20 years ago, we worked on an effort to overhaul our Nation's flood insurance, which needed to be overhauled then, and frankly, still needs it today. One of the things that I found is that a lot of people want levees built to protect them and their family, their homes, their businesses, to protect them from floods and to protect them from having to buy flood insurance. Let me just ask, how is the latter issue handled by the Corps? How is that issue handled by the Corps?

Mr Woodley. Senator, we work very closely with FEMA on defining and setting the parameters necessary for them to operate their program. But their program actually does not directly influence our decisionmaking on formulating projects. That is, our methodology in formulating new projects is determined by the value of the property that is expected to be protected and the amount of value then of benefit to the Nation from protecting it depends on the risk that it is under or the amount to which we are reducing its risk of being destroyed, then compare that against the cost of creating the engineering structure and, or the cost of the whole project with the non-structural and structural elements. Then you do the cost benefit analysis, and if you get a benefit from that, then we could recommend that a project be built.

And that may have the additional benefit of freeing the residents of the area from the necessity of purchasing flood insurance. If it does, I think that is a separate benefit, not a direct benefit from the project. That is not why we build the project, that is a benefit. It may be why the people who live there want the project to be built even more than their concern about inundation. But within our program, it is not used as a factor.

Senator CARPER. Does anyone want to add to that? General Riley?

General RILEY. Yes, sir, thank you, if I might. FEMA and the Corps work closely together; we have worked with many communities together. If I could just refer to this chart on my right as to how one State, has taken the work that FEMA and we have done with all of the State and flood plain managers around the Nation.

In this case, it is California, and I asked permission to use their chart. This was our sort of depiction, our concept of buying down risk, all the different methods you can use to lower the risk of living in a flood plain, where you begin with an initial risk and you take steps. It is a shared responsibility, so everybody participates. It would be building codes, zoning, outreach, evacuation planning,

insurance, and levees. Then you still end up with some residual risk. That is what has been missing in the past, when people thought if they had a levee, they were protected.

What California did, they took this, they came back to us, here is what we are doing to buy down risk. And they put several hundreds of millions of dollars behind this effort in the State of California, especially, and this is in the central valley in this particular case, where they start with the most critical levee repairs, they go through some Federal projects, but then they get into State projects as well. They go down through building codes, insurance restrictions of building in the flood plain. After 2015, if they are not making adequate progress in protection, then they won't allow development. After 2025, there will be no development in a 200-year flood plain.

So they have taken all those steps. This is about a 35 page briefing. I picked one slide out of it. But they go into great detail how they show that everybody, from State, local and private, insurance, bankers, developers, investors, all participate in lowering the flood risk. At the end of it, there is still a residual risk and that gets back to the education question you asked earlier.

Senator CARPER. Good, thank you. What is the old saying, a picture is worth a thousand words. That is a pretty good picture. Thanks for sharing that with us.

Just a followup to my earlier question on flood insurance. What should the Corps' role be in ensuring that the flood insurance program is solvent and that people living in high risk areas have flood insurance? The answer may be, well, we have no responsibility, but there may be some responsibility. We found on the heels of Katrina that a 20 year old flood insurance or 35 year old flood insurance program was all of a sudden underwater to the tune of about \$20 billion. The flood insurance program statutorily may draw on the Treasury, they have a line of credit to the Treasury. Over the years, it has been sort of off and on in terms of being solvent. But after Katrina, it was \$20 billion underwater. But what role, if any, do you think is appropriate for the Corps with respect to trying to make sure that the program is solvent going forward?

Mr Woodley. Senator, I don't think we participate in the management of the program to the extent of assuring its solvency. But I think that the way we manage, or the way we formulate projects, has changed in that we now are looking, when we formulate a project, we are looking at more non-structural measures. Those can include the buy-out of flood-prone areas and returning those areas to a natural flood plain State. We have done that in many, many cases as part of a mixture of different measures, whereas at some point in the past, we might have advocated a purely engineering solution of protecting all areas, to the maximum extent possible.

Now, we will ask the question, is it really better that some part of this community be relocated and the place that they had previously settled be returned to a flood plain State. If you look at places like Grand Forks in North Dakota, where we have actually implemented that, and some projects in California and others in parts of the Midwest. Obviously, once that happens, all those formerly at-risk structures are no longer in the flood insurance program and the additional structures that would be in the flood pro-

gram would, we hope, have a lower level of risk, increasing that solvency of the program to that degree.

Senator CARPER. Thank you. There is a community in northern Delaware which I mentioned earlier that went through, over a span of about a half dozen years, two 100 year floods. The decision was finally made that, maybe we don't want to look for that third time for lightning to strike. The community people were assisted and helped to relocate from there. The area has been pretty much returned to its natural State.

OK. In closing, anything that either of the three of you would like to say, reiterate, say again, repeat, emphasize? Or just or not. General Walsh, you are welcome to chime in here as well, if there is anything you want to add.

General RILEY. Sir, if I may, to add to the last question, I co-chair an intergovernmental committee with the director of FEMA's flood mitigation program. We meet quarterly, and we meet with all of the representatives of the flood and storm managers around the Nation, the State and local storm managers. So we work that together to get consistency of FEMA and Corps policy and the application of those.

Senator CARPER. Good.

General RILEY. We get the State and local feedback at the same time.

Second, on the flood insurance program, a major purpose of that is flood risk education. So we work closely with FEMA to educate people on their actual flood risk, and then of course, FEMA deals with the insurance component of that.

Senator CARPER. Good, thank you. Thanks for that clarification. Secretary Woodley.

Mr Woodley. Senator, the only thing that I wanted to make sure we had indicated on the record in this hearing is that we had discussed in the supplemental appropriation, there was some approximately \$600 million in emergency funding for the Corps, of which about half was directed to the Midwest. I would like to have it in the record very clearly that is a preliminary amount intended as a, well, certainly more than a placeholder, but at the time that the supplemental was prepared, we had by no means, and we even now today have not conducted the kinds of assessments and engineering work and cost estimates necessary to determine the final amount.

So I think it is clearly indicated in our submissions, but I wanted to make it clear on the record of this hearing, that the amounts in the supplemental are very likely to be increased later as a result of the detailed assessments of our facilities, and of the damaged levees that are currently underway in the Mississippi Valley Division.

Senator CARPER. All right, thank you. General Walsh, do you want to add a closing word before I give the benediction?

[Laughter.]

General WALSH. Yes, thank you, Senator. I just wanted to mention that when I visited Quincy, Illinois and Hannibal, Missouri, Cedar Rapids, Waterloo, Iowa, Des Moines, Iowa—

Senator CARPER. When were you at those places?

General WALSH. During the flood fights. I was very proud of our American people in working the flood fights. Certainly in Quincy,

when the mayor asked for some volunteers to fill sand bags, 5,000 folks showed up working day and night filling sand bags. Thirteen million sandbags is what we distributed and filled, not just at Quincy but at other places as well.

At Hannibal, again, volunteers just working day and night, putting together reception centers and just watching small government and the prideful American people to go after these floods, it was very moving to me.

I talked to Governor Culver and the Governor of Illinois and Missouri and told them I was very proud of their people and how they were responding to these floods. Just let us figure out how to do it, and we will ask you when we need help. I think we have been able to respond to that so far.

Senator CARPER. That is inspiring to hear that account. Thank you.

Let me just close by saying, on behalf of not just the people who live in the communities that you have just mentioned, but from west coast to east coast, and particularly the folks in Delaware, DelMarVa Peninsula, whom I am privileged to represent, we have a wonderful history of working with the folks who run your operation in the greater Delaware area, which includes a suburb of Wilmington, Philadelphia. That is a little humor there. But you had some just terrific leadership, on the military side and on the civilian side. We very much treasure, I think that is probably not too strong a word, treasure the relationship we have and the terrific cooperation that we get and support that we receive from the Army Corps. So thank you very, very much.

With that having been said, I am going to reach over here and grab Chairman Boxer's gavel and we will conclude this hearing. Thank you so much.

[Whereupon, at 11:07 a.m., the committee was adjourned.]

STATEMENT OF HON. JAMES M. INHOFE, U.S. SENATOR  
FROM THE STATE OF OKLAHOMA

Thank you, Chairman Boxer. I'd like to welcome our colleagues who are here today to give us their observations on the impacts of the flooding and what their communities might now need. Also welcome to Secretary Woodley and General Walsh, who will provide us with specific details on the emergency preparedness and response activities of the Corps of Engineers and whether their efforts were at all hampered by existing authorities, as well as the impacts of the flooding across all Corps mission areas.

The Corps of Engineers can play a critical role during excessive rain events. Last year, my home State of Oklahoma experienced record-breaking floods, but the Corps was right there to help lessen the impacts. The Tulsa District did an excellent job of, in particular, managing water levels at the reservoirs in order to prevent hundreds of millions of dollars in additional damages. Unfortunately, these floods caused a fair amount of damage at our recreation areas, leading to reduced services this year. Heavy rains again this year in the region have had impacts for the navigation industry as well.

The flooded region today's hearing is focused on is facing a similarly broad range of water resources issues. It is not simply a question of whether the levees performed as intended and if so, whether we need more or larger levees or if not, why not. The questions we need to discuss involve how to balance all the needs and benefits of the Mississippi River and its tributaries.

These waterways are used for navigation, recreation, hydropower, fish and wildlife habitat and other water resources needs. Sometimes these uses seem to be in conflict with one another. It is our job as policymakers to provide the technical experts at the Corps of Engineers with enough guidance and the proper tools to promote the national interest in the use of the waterways. Today we get a chance to

hear a status update on this particular flooding incident, as well as any recommendations for future improvements.

