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WATER RESOURCES DEVELOPMENT ACTS: STATUS OF IMPLEMENTATION AND ASSESSING FUTURE NEEDS

(116–26)

HEARING

BEFORE THE

SUBCOMMITTEE ON
WATER RESOURCES AND ENVIRONMENT

OF THE

COMMITTEE ON
TRANSPORTATION AND
INFRASTRUCTURE
HOUSE OF REPRESENTATIVES

ONE HUNDRED SIXTEENTH CONGRESS

FIRST SESSION

JULY 10, 2019

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Committee on Transportation and Infrastructure
U.S. House of Representatives
Washington, DC 20515

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Ranking Member

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JULY 1, 2019

SUMMARY OF SUBJECT MATTER

TO: Members, Subcommittee on Water Resources and Environment
FROM: Staff, Subcommittee on Water Resources and Environment
RE: Subcommittee Hearing on "Water Resources Development Acts: Status of Implementation and Assessing Future Needs"

PURPOSE

The Subcommittee on Water Resources and Environment will meet on Wednesday, July 10, 2019, at 10:00 a.m. in Room 2167, Rayburn House Office Building, to receive testimony related to the development and implementation of water resources development acts (WRDA)—which are principal legislative vehicles to authorize studies, projects, and policies carried out by the U.S. Army Corps of Engineers–Civil Works (Corps). The purpose of this hearing is to provide Members with an opportunity to review the Corps' implementation of the most recent congressionally-authorized WRDAs, enacted in 2014, 2016, and 2018. This hearing will also begin to identify future needs to inform the development of WRDA 2020, which the Committee expects to develop and approve next year.

BACKGROUND

The Corps is the federal government's largest water resources development and management agency and is comprised of 38 district offices within eight divisions. The Corps operates more than 700 dams; has constructed 14,500 miles of levees; and maintains more than 1,000 coastal, Great Lakes, and inland harbors, as well as 12,000 miles of inland waterways.[1]

Navigation was the earliest Civil Works mission, when Congress authorized the Corps to improve safety on the Ohio and Mississippi Rivers in 1824. Since then, the Corps' primary missions have evolved and expanded to include flood damage reduction along rivers, lakes, and the coastlines, and projects to restore and protect the environment. Along with these missions, the Corps is the largest generator of hydropower in the nation, provides water storage opportunities to cities and industry, regulates development in navigable waters, assists in national emergencies, and manages a recreation program. To date, the Corps manages nearly 1,500 water resources projects.

The standard authorization process for a Corps project requires two separate congressional authorizations—one for studying feasibility and a subsequent one for construction. Congress traditionally considers Corps projects and policy authorizations biennially through the enactment of a WRDA bill. Congress has enacted three consecutive WRDA bills since 2014.

STATUS OF WRDA IMPLEMENATION

The Water Resources Development Act of 2018 (WRDA 2018) was signed into law as Title I of the *America's Water Infrastructure Act* (P.L. 115–270) by President Trump on October 23, 2018. WRDA 2018 authorized 14 Chief's Reports, authorized four new Post Authorization Change Reports, 10 new feasibility studies, and requested that the Corps expedite completion of 32 existing feasibility studies. As part of implementing WRDA 2018, the Corps must also consider whether or not to issue new guidance for specific programs to aid in the execution of the provision. The Corps held a 60-day public comment period for the development of guidance, which

[1] https://www.crs.gov/Reports/R45185#fn1.

closed on February 12, 2019. Since enactment of WRDA 2018, the Corps has issued 36 implementation guidance documents[2]. Similarly, there are two provisions of the WRDA 2014 (sections 1001—vertical integration and acceleration of studies and 1043b—pilot project for non-federal implementation of projects) and three provisions (sections 1139—dam safety, 1162—fish and wildlife mitigation, 1163—wetlands mitigation) of the WRDA 2016 where the Corps issued revised guidance this year as a result of additional guidance in WRDA 2018.

DEFINING FUTURE NEEDS AND SECTION 7001 ANNUAL REPORT

The *Water Resources Reform and Development Act of 2014* (WRRDA 2014, P.L. 113–121) established a mechanism for Corps projects and studies to be communicated to Congress for potential authorization. Section 7001 of WRRDA 2014 requires the Secretary of the Army to annually publish a notice in the *Federal Register* requesting proposals from non-federal interests for new project authorizations, new feasibility studies, and modifications to existing Corps projects. Further, it requires the Secretary of the Army to submit to Congress and make publicly available a "Report to Congress on Future Water Resources Development" (Annual Report) of those activities that are related to the missions of the Corps and require specific authorization by law.

Additionally, Section 7001 contains a provision that requires the Corps to submit to Congress an appendix containing descriptions of those projects requested by non-federal interests that were not included in the Annual Report. Submission of the Annual Report (and the appendix) allows Congress to review all requests submitted by non-federal interests to the Corps.

Since WRRDA 2014, the Annual Report has been used as a guide from which Congress considers which studies, projects, and modifications will receive authorization in future WRDA legislation. This process was required in part, because of a Congressional ban on earmarks in 2011. In June 2019, the Corps submitted their Annual Report[3] for Congressional consideration.

The Corps is currently soliciting proposals[4] for inclusion in the 2020 Report to Congress. The deadline for proposals is August 27, 2019.

CONCLUSION

As the Committee on Transportation and Infrastructure moves forward in developing the next WRDA legislation, this hearing is intended to provide Members with an opportunity to review implementation of past WRDAs and begin consideration of potential projects and policy initiatives that benefit the Nation.

WITNESSES

PANEL 1

- The Honorable Rickey Dale "R.D." James, Assistant Secretary of the Army (Civil Works), Office of the Assistant Secretary of the Army–Civil Works
- Major General Scott A. Spellmon, Deputy Commanding General for Civil and Emergency Operations, United States Army Corps of Engineers

PANEL 2

- Mr. Rob Innis, Plant Manager, Sparrows Point, LafargeHolcim, on behalf of the of Waterways Council Inc.
- Mr. Chad Berginnis, Executive Director, Association of State Floodplain Managers
- Mr. Tom Waters, Chairman, Missouri Levee and Drainage District Association
- Ms. Julie Hill-Gabriel, Vice President for Water Conservation, The National Audubon Society
- Mr. Derek Brockbank, Executive Director, American Shore and Beach Preservation Association
- Mr. F. Martin "Marty" Ralph, Ph.D., Director, Center for Western Weather and Water Extremes, Scripps Institution of Oceanography at UC San Diego

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[2] https://www.usace.army.mil/Missions/Civil-Works/Project-Planning/Legislative-Links/wrda_2018/wrda2018_impguide.

[3] https://usace.contentdm.oclc.org/utils/getfile/collection/p16021coll5/id/35439.

[4] https://www.federalregister.gov/documents/2019/04/29/2019-08583/proposals-by-non-federal-interests-for-feasibility-studies-and-for-modifications-to-an-authorized.

WATER RESOURCES DEVELOPMENT ACTS: STATUS OF IMPLEMENTATION AND ASSESSING FUTURE NEEDS

WEDNESDAY, JULY 10, 2019

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON WATER RESOURCES AND ENVIRONMENT,
COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE,
Washington, DC.

The subcommittee met, pursuant to notice, at 10:02 a.m., in room 2167, Rayburn House Office Building, Hon. Grace F. Napolitano (Chairwoman of the subcommittee) presiding.

Present: Representatives Napolitano, DeFazio, Mucarsel-Powell, Johnson of Texas, Garamendi, Lowenthal, Carbajal, Espaillat, Finkenauer, Delgado, Pappas, Craig, Rouda, Malinowski; Westerman, Graves of Missouri, Webster, Massie, Woodall, Babin, Graves of Louisiana, Rouzer, Bost, Weber, Mast, Palmer.

Mrs. NAPOLITANO. Good morning. I call this hearing to order, and today's hearing is an opportunity to review the Corps implementation of the most recently passed congressionally authorized WRDA. Enacted 2014, in 2016, and 2018. This hearing will also begin to identify future needs to inform the development for a new WRDA 2020.

Let me begin by asking unanimous consent that committee members not on the subcommittee be permitted to sit with the subcommittee at today's hearing and ask questions.

Without objection, so ordered.

The Army Corps of Engineers is, simply put, the Nation's premier water resources expert for our Nation. Congress has vested significant responsibility in the Corps to carry out vital navigation, flood control, and ecosystem restoration projects for the benefit of our communities, and for our Nation. Each of these projects has been thoroughly studied by the Corps and authorized by Congress through biennial Water Resources Development Acts.

This committee, on a bipartisan basis, has traditionally worked to move a Water Resources Development Act every 2 years, and has successfully enacted three consecutive Water Resources Development Acts since 2014. Through these WRDAs, this committee seeks to address local, regional, and national needs through authorization of new Corps projects, studies, and policies that benefit every corner of our Nation.

The Corps implementation of Water Resources Development Acts, particularly WRDA 2018, is very important for us to under-

stand. We want to know that the Corps implements the law as Congress intended and ensure that the Corps continues to remain responsive to national, regional, and local priorities, and to a changing climate, and has the funding to do so.

I am specifically interested in WRDA provisions that involve the National Dam Safety Program, nature-based infrastructure initiatives, using data to enhance operations at our reservoirs, and the Corps assessment of their authorized project backlog. For my district in California, I am very keenly interested in ensuring that this vital dam safety work at Whittier Narrows is completed expeditiously.

After more than 12, 14 years, something like that, as well as ensuring the Corps has the tools and funding it needs to ensure a reliable source of water for the drought-prone areas in the West. Staying on the 2-year schedule for enacting the next new WRDA is critical to water infrastructure to the Nation, and today's hearing starts the process for the development of a 2020 WRDA, but Congress is only half the equation. We must have a partner in the Corps and this administration in requesting funding for the congressionally authorized projects and studies. When the administration includes the words, "No New Start" in a budget request, that means, "No new infrastructure."

Secretary James, General Spellmon, thank you for being here today. I would like to thank very much all of the South Pacific region. I thank you and very much for their work and partnership through the years, and I would like to welcome our stakeholder panel for their participation in today's hearing.

I look forward to working with all of you in the development of the next WRDA 2020 and your testimony.

[Mrs. Napolitano's prepared statement follows:]

Prepared Statement of Hon. Grace F. Napolitano, a Representative in Congress from the State of California, and Chairwoman, Subcommittee on Water Resources and Environment

The Army Corps of Engineers is—simply put—the nation's premier water resources expert for our Nation.

Congress has vested significant responsibility in the Corps to carry out vital navigation, flood control, and ecosystem restoration projects for the benefit of our communities and our nation. Each of these projects has been thoroughly studied by the Corps and authorized by Congress through biennial water resources development acts.

This Committee, on a bipartisan basis, has traditionally worked to move a water resources development act every two years, and has successfully enacted three consecutive Water Resources Development Acts since 2014. Through these WRDAs, this Committee seeks to address local, regional, and national needs through authorization of new Corps projects, studies, and policies that benefit every corner of the nation.

The Corps implementation of the Water Resources Development Acts, particularly WRDA 2018, is important for us to understand. We want to know that the Corps implements the law as Congress intended, and ensure that the Corps remains responsive to national, regional, and local priorities and to a changing climate.

I am specifically interested in WRDA provisions that involve the National Dam Safety Program, nature-based infrastructure initiatives, using data to enhance operations at our reservoirs, and the Corps' assessment of their authorized project backlog.

For my district, I am very interested in ensuring that vital dam safety work at Whittier Narrows Dam is completed expeditiously, as well as ensuring the Corps'

has the tools and funding it needs to ensure a reliable source of water for the drought prone areas in the west.

Staying on a two-year schedule for enacting a new WRDA is critical to water infrastructure to the nation, and today's hearing starts the process for the development of a 2020 WRDA.

But Congress is only half of the equation. We must have a partner in the Corps and this administration in requesting funding for Congressionally-authorized projects and studies. When the administration includes the words "NO NEW START" in a budget request, what that means is a NO to infrastructure.

Secretary James and General Spellmon, thank you for being here today. I would also like to thank the South Pacific Region and the L.A. District of the Corps for their work and partnership throughout the years. I would also like to welcome our stakeholder panel for their participation in today's hearing.

I look forward to working with you all in the development of a 2020 WRDA, and in your testimony today.

Mrs. NAPOLITANO. At this time, I am pleased to yield to my colleague, the ranking member of the subcommittee, Mr. Westerman, for any thoughts he may have.

Mr. WESTERMAN. Thank you, Chairwoman Napolitano, and in a bipartisan manner, I would associate myself with your comments. Very, very good remarks there. Thank you for holding this important hearing and thank you to our witnesses for being here today to discuss the important work that the Corps of Engineers does.

I am proud to be able to work on this committee that has been able to pass three major transformational WRDA laws in the last three Congresses that are there to improve our Nation's water resources infrastructure. With this tremendous accomplishment, I want to urge the Corps to expeditiously implement some of the great reforms from these three laws.

As we look forward to future water resources legislation, one issue that cannot be overlooked is the flooding that has occurred across the Nation. Out of all, the Arkansas River back in my home State in my district was swollen to historic levels, flooding homes, breaching levees, and devastating farmland. Arkansas is by no means alone in these experiences. Our neighbors in Oklahoma, Mississippi, Missouri, Louisiana, Kansas, Iowa, and beyond have all been affected by heavy rains this year.

Unprecedented floodings such as this should serve as a catalyst for us to reexamine infrastructure to ensure it is updated and capable of protecting life and property. These disasters beg an important question: What can Congress do to prevent future flooding, or more importantly, how can we improve infrastructure within our States to reduce the risk of dam and levee breaches?

In Arkansas alone, we have seen an estimated $23 million per day in economic loss along the Arkansas River as barges and boats can no longer navigate our inland waterways. Much of this waterborne commerce is dependent on infrastructure that was initially constructed in the 1960s and 1970s and is quickly approaching the end of its shelf life.

So, as the flooded waters recede across the Nation, it is important for this committee to continue its bipartisan commitment to work and pass critical water resources legislation. We can't afford another year of flooded homes and washed out farmlands. This is a sight that none of us want to see and the American people deserve better than this.

I look forward to hearing about the Corps implementation of the recent WRDAs and hearing constructive ideas from our witnesses across both panels and addressing our future water resources infrastructure needs.

[Mr. Westerman's prepared statement follows:]

Prepared Statement of Hon. Bruce Westerman, a Representative in Congress from the State of Arkansas, and Ranking Member, Subcommittee on Water Resources and Environment

Thank you Chairwoman Napolitano for holding this important hearing, and thank you to our witnesses for being here today to discuss the important work of the Army Corps of Engineers.

I'm proud to be able to work on this Committee that has been able to pass three major, transformational WRDA laws in the last three Congresses to improve our Nation's water resources infrastructure. With this tremendous accomplishment, I want to urge the Corps to expeditiously implement some of the great reforms from these three laws.

As we look forward to future water resources legislation, one issue that cannot be overlooked is the flooding that has occurred across the Nation.

While the Arkansas River was swollen to historic levels, flooding homes, breaching levees, and devastating farmland, Arkansas is by no means alone in these experiences. Our neighbors in Oklahoma, Mississippi, Missouri, Kansas, Iowa, and beyond have all been affected by heavy rains this year. Unprecedented flooding such as this should serve as a catalyst for us to re-examine infrastructure, to ensure it is updated and capable of protecting life and property.

These disasters beg an important question: what can Congress do to prevent future flooding? Or more importantly, how can we improve infrastructure within our states to reduce the risk of dam and levee breaches?

In Arkansas alone, we've seen an estimated $23 million in daily economic loss along the Arkansas River as barges and boats can no longer navigate our inland waterways. Much of this waterborne commerce is dependent on infrastructure that was initially constructed in the 1960s and 1970s, and is quickly approaching the end of its shelf life.

So as the flood waters recede across the Nation, it is important for this Committee to continue its bipartisan commitment to work and pass critical water resources legislation. We can't afford another year of flooded homes and washed out farmlands. The American people deserve better than this.

I look forward to hearing about the Corps' implementation of the recent WRDAs, and hearing constructive ideas from our witnesses across both panels on addressing our future water resources infrastructure needs.

Mr. WESTERMAN. I yield back.

Mrs. NAPOLITANO. Thank you, Mr. Westerman, for your statement. I now recognize Mr. DeFazio, the chairman of the full committee.

Mr. DEFAZIO. I thank the gentlelady and thank her for holding this hearing to kick off the 2020 Water Resources Development Act authorization. The former chairman, Bill Shuster, got us back on track with doing an authorization every 2 years, and I fully intend to continue in that tradition.

The Corps functions are so critical to many parts of the Nation, whether we are talking about navigation or we are talking about flood control or we are talking about ecosystem restoration, other missions, anticipation of severe climate events with changes in the climate. The Corps operates 2,200 levees, 700 dams, largest producer of clean, renewable hydropower in the United States of America. Many of its functions are critical and benefit us every day.

WRDA provides direction to the Corps, and we will, as I said, do a 2020 bill, but we do want to look back at the past bills and see whether these bills and the reforms and programs that they proposed have been implemented as intended, and it is also critical, and I am not going to press the Secretary on this.

We had a former colleague who sat in that role a number of years ago, and I asked him. I said, "Is this budget adequate to do what the Corps needs to do?" And he said, "No, it isn't." And the next Monday, he decided he wanted to leave his job for family purposes. So, I am not going to put you on that spot, but as much as possible, you have got to advocate for and tell us your needs so that we can anticipate them.

I also intend to fully utilize the Harbor Maintenance Trust Fund for its intended lawful purpose, stop diverting funds to other parts of the Government, and recapture the funds that have been essentially sequestered somewhere in the bowels of the Treasury on a computer or somewhere. So, that bill passed out of committee.

I am pushing my leadership to move that bill through the House on a daily basis. We have less than 40 percent utilization to authorized depths at the 50 largest harbors in America. Other places in my district and others, you know, jetties are crumbling and the faster and the more they fail, the more they cost to repair, and we have got to get at these tasks. We have got to unlock those funds and get the job done.

So, I welcome the Secretary and the General here today, and I mean no disrespect, but I have to go to deal with some aviation issues, but there will be, I am certain, much interest on the committee, and we look forward to your testimony. Thank you for being here, and thanks to the other witnesses also.

[Mr. DeFazio's prepared statement follows:]

Prepared Statement of Hon. Peter A. DeFazio, a Representative in Congress from the State of Oregon, and Chairman, Committee on Transportation and Infrastructure

For nearly 200 years, the U.S. Army Corps of Engineers (Corps) has played a central role in addressing the Nation's water resources needs for navigation, flood protection, ecosystem restoration, and other missions. The Corps is crucial in managing our Nation's infrastructure, operating nearly 2,200 levee systems and 700 dams across the US, and is the largest producer of hydropower in the country.

Yet, the first step in any Corps project or activity comes through authorization in a water resources development act (or WRDA). Regular enactment of WRDAs provides this Committee with the opportunity to oversee the Corps' implementation of projects and to ensure that the Corps remains responsive to national, regional, and local priorities, as well as a to a changing climate. It is for this reason that the Committee intends to develop and approve a WRDA 2020 bill next year.

Today, we will also examine whether the Corps is implementing prior Water Resources Development Acts as Congress intended. This means issuing implementation guidance in a timely manner and including in their budget requests and work plans necessary funding of authorized Corps projects.

I want to reiterate the need for the administration to request funding for authorized projects. Not funding authorized projects leaves the Corps with only two options—slow projects down or carry out fewer projects. Both options are unacceptable. Shortchanging the Corps impacts their ability to carry out its missions, implement congressional directives, and operate in a timely fashion.

You can be sure I will continue to work to enact the next WRDA and to build on the successes of the last two Congresses in the full utilization of the Harbor Maintenance Trust Fund. My bill was passed out of Committee by voice vote last month and awaits consideration by the Full House. H.R. 2440 honors our long-term

commitment to U.S. shippers and taxpayers by using the Trust Fund proceeds for their intended purposes. Through this legislation, approximately $34 billion in harbor maintenance taxes will be available over the next decade to maintain our harbors and ports.

Rising tides raise all ships—and enactment of this legislation will pave the way for further adjustments in WRDA to ensure all our nation's ports—large and small—are maintained to their appropriate widths and depths and that the unique needs of all our harbors, including our largest ports, can be addressed.

Secretary James and General Spellmon, thank you for being here today. I look forward to working with you to provide much needed assistance to our communities in maintaining our Nation's ports, harbors, and environment.

Let's implement WRDA 2018, fund these important projects and studies, and move forward to WRDA 2020.

Mrs. NAPOLITANO. Thank you, Mr. DeFazio, and now, I yield to the ranking member for the full committee, Mr. Graves.

Mr. GRAVES OF MISSOURI. Thank you, Madam Chair and Ranking Member Westerman for holding this obviously very important hearing. In the past, as it has been pointed out already, the past three Congresses, this committee has passed three WRDA bills, and I look forward to doing that again in another one in the law in 2020.

As we look at the future needs of our country and one of the most relevant issues continues to be the extensive flooding that we are seeing on the Mississippi River and the Missouri River Basins. In 2011, we thought that we had learned our lesson from a historic Missouri River flooding incident, but once again, here we are 8 years later, and we find ourselves in even worse shape. While we don't know what the full cost of this flooding season is going to be, we anticipate that it is probably going to be several billion dollars and the costs of flood damage are extensive and includes agricultural losses, business interruption, infrastructure damage, and individual and public assistance.

The first levee breaches in my district occurred in mid-March and some ground has been underwater ever since then, flooded for almost 4 months. When farmland is flooded for that long, it can be completely covered in sand, in sediment, and what that does is render it unusable for many years. In my district, I have 81 levee systems and almost 3,000 miles of levees protecting highly productive farmland and thousands of residents and businesses along the Missouri River, and the Mississippi River for that matter.

Virtually every levee from Iowa to Kansas City overtopped our breach from the initial March event, and again in May and June with those flooding events. Almost every levee downstream of Kansas City it overtopped, they overtopped and breached, and when levees breach and residents have a very short period of time to collect what belongings they can and get to higher ground, thousands of acres of farmland become utterly devastated and may never see a crop again. Road closures cost businesses, gas stations, convenience stores, restaurants, retailers, you name it, other businesses, it costs them a lot of income and ultimately, it costs local jurisdictions a lot of revenue. States, counties, cities, and a lot of other local entities are going to continue to have to spend money that they simply don't have for critical infrastructure repair and municipal services.

The most important impacts of the flood are the impacts on people. I have neighbors, friends, and family that have all been dev-

astated by this flooding event and the displacement and disruption of people's lives is more than just dollars and cents. It is a disruption of their peace of mind, their feeling of safety, and the prospect of having to pick up the pieces and try to rebuild their lives and their communities.

Missourians are tough and we are going to get through this together, but we can't lose perspective on what was really lost here as we strive for better outcomes from the public policy that we are going to debate here in Congress. It is very important that we hear from our witnesses today about the devastation that this flood has caused, but it is just as important to hear what we think the future needs to be when it comes to managing the upper Mississippi and Missouri Rivers, and I believe personally that we are asking the Corps of Engineers to balance too many priorities and that when life, property, and safety are at stake that flood control has to be the number one priority.

From Gavins Point Dam to the mouth of the Missouri River, we are slated to spend only $13 million on annual levee maintenance while at the same time, we are slated to spend $30.7 million on wildlife reclamation and habitat creation in that same stretch of river. The fact of the matter is there has to be some adjustments made on the consideration of people's lives and their property.

And with that, Madam Chairman, I look forward to hearing from the witnesses today, and I yield back.

[Mr. Graves of Missouri's prepared statement follows:]

Prepared Statement of Hon. Sam Graves, a Representative in Congress from the State of Missouri, and Ranking Member, Committee on Transportation and Infrastructure

In the past three Congresses, this Committee has passed three Water Resources Development Acts (WRDAs), and I look forward to again working together to enact another one into law in 2020.

As we look at the future water needs of the country, one of the most relevant issues continues to be the extensive flooding on the Upper Mississippi and Missouri River Basins. Back in 2011, we thought we had learned our lesson after the historic Missouri River flooding, but once again, eight years later, we find ourselves in even worse shape.

While we don't know what the full cost of this flooding season will be, we anticipate that it is probably going to be several billion dollars. The costs of flood damage are extensive and include agriculture losses, business interruption, infrastructure damage, and individual and public assistance.

The first levee breaches in my district occurred in mid-March, and some ground has been underwater ever since then—flooded for almost four months. When farmland is flooded for that long, it can be completely covered in sand and sediment, rendering it unusable for years.

My district has about 81 levee systems and 2,552 miles of levees protecting highly productive farmland and thousands of residents and businesses along the Missouri River alone. Virtually every levee from Iowa to Kansas City overtopped or breached from the initial March event. And again in the May and June flooding events, almost every levee downstream of Kansas City overtopped or breached.

When levees breach, residents often only have a few hours to collect what belongings they can to get out of danger; thousands of acres of farmland become utterly devastated and may never see a crop again; road closures cost gas stations, restaurants, retailers, and other businesses income; and ultimately, it costs local jurisdictions a lot of revenue. States, counties, cities, and a lot of other local entities are going to continue to have to spend money they simply don't have for critical infrastructure repairs and municipal services.

But the most important impacts of floods are the impacts on people. These are my neighbors, friends, and family. The displacement and disruption of people's lives

is more than just dollars and cents. It's a disruption of their peace of mind, their feeling of safety, and the prospect of having to pick up the pieces and trying to rebuild their lives and their community.

Missourians are tough. And we will get through this together. But we cannot lose perspective of what was really lost here as we strive for better outcomes from the public policy that we debate in Congress.

It is very important that we hear from our witnesses today about the devastation this flood has caused. But it is just as important to hear what we think the future needs to be when it comes to managing the Upper Mississippi and Missouri Rivers.

I believe, personally, that we are asking the Corps of Engineers to balance too many priorities—and that when life, property, and safety are at stake, flood control must always be priority number one. From Gavins Point Dam to the mouth of the Missouri River, we are slated to spend only $13 million on annual levee maintenance, while we are slated to spend $30.7 million on wildlife reclamation and habitat creation in that same stretch of river. The fact of the matter is there must be some adjustments made for the consideration of people's lives and property.

Mrs. NAPOLITANO. Thank you, Mr. Graves. I now ask unanimous consent that the letters from the Florida Ports Council and the National Marine Manufacturers Association be included in the record in support of WRDA 2020.

[Florida Ports Council and National Marine Manufacturers Association's letters are on pages 117–120.]

Mrs. NAPOLITANO. Now, we will proceed to hear from the witnesses, who will testify, and thank all of you for being here, both of you.

For panel 1, we have the Honorable R.D. James, Assistant Secretary of the Army, Civil Works, and we welcome you. Hello.

Major General Scott A. Spellmon, Deputy Commanding General for Civil and Emergency Operations, United States Army Corps of Engineers. Welcome to both of you.

Without objection, your prepared statements will be entered into the record, and all witnesses are asked to limit their oral remarks to 5 minutes, and Secretary James, you may proceed.

TESTIMONY OF HON. R.D. JAMES, ASSISTANT SECRETARY OF THE ARMY FOR CIVIL WORKS, OFFICE OF THE ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS); AND MAJOR GENERAL SCOTT A. SPELLMON, DEPUTY COMMANDING GENERAL FOR CIVIL AND EMERGENCY OPERATIONS, U.S. ARMY CORPS OF ENGINEERS

Mr. JAMES. Thank you, Chairwoman Napolitano, Ranking Member Westerman, and all distinguished members of this committee. Thank you for the opportunity to be here today.

I have been the Assistant Secretary of the Army for Civil Works for 15 months and my goals today are the same as they were when I started: focus on outcomes, expedite the process, and move dirt, making the best use of all available funds. Since last year, I have had the pleasure to meet with many of you to discuss your views on the Army Civil Works program. Your input is appreciated, and I remain committed to working with each of you.

The fiscal year 2020 budget provides $4.8 billion for the Corps, focusing on investments that will yield high economic and environmental returns or address a significant risk to public safety. This budget relies on a foundation of strong relationships between the Corps and local communities. It allows us to work together to help

manage, develop, restore, and protect their water resources and infrastructure.

The budget focuses on the three main mission areas of the Corps of Engineers: flood control, commercial navigation, and aquatic ecosystem restoration. The fiscal year 2020 budget supports a Corps program that has a diverse set of tools and approaches to working with local communities, whether this means funding projects with our cost-sharing partners, providing planning assistance and technical expertise, or participating in the national and international conversations on how to best address our future water resource challenges.

The budget helps improve our efforts on resiliency and sustainability. The budget also funds two new, innovative programs in the construction account. One of them is the 1043 program, and it is budgeted for $150 million, and that's where the Corps could transfer appropriated funds to a sponsor who desired to construct a project on their own.

There is another one, the Innovative Funding Partnerships program, also funded at $150 million to be used in conjunction with funds voluntarily provided by non-Federal interests in excess of the non-Federal cost-share to accelerate completion of construction of specifically authorized projects.

In addition, the budget proposed to extend the authorization for section 1043 of WRRDA 2014 as amended, which under current law expired on June 10th of this year.

Since the enactment of the Water Resources Development Act of 2018, the Chief of Engineers has issued a report with recommendations on 15 proposed water resource projects. I provided a detailed list of all of those projects in my official statement that I have submitted to this committee.

Since receiving my appointment to ASA(CW), I focused on how the Corps executes all available funds. This involves identifying needed investments and ensuring that we complete execution in a more cost-effective and efficient way. This approach will ensure a better return on the taxpayer's investment and better the lives of Americans.

Under my oversight and direction, and with the help of Lieutenant General Semonite and his team, such as General Spellmon, the Corps is committed to improving the performance of the Civil Works program. The Corps also is using its engineering expertise and relationships with project partners and stakeholders to develop new approaches to address some of the most pressing water resources challenges facing our Nation.

And I would like to say there that I feel like the Corps got away from working with their partners. I am talking about the local people on the ground that the district engineers work with regularly, and we are trying to get back to that. We are trying to invite our partners to meetings, we are trying to make them a part of the process and the decisions that we make as Corps of Engineers, and I feel that is very important.

Improving performance and timely delivery of quality products continue to be one of my highest priorities. To that end, I have completed the guidance for all provisions of the Water Resources Development Act of 2018 and much to my distress, I discovered

that when I took this office in February of 2018, there was guidance outstanding due to this committee from 2014 and 2016.

I pledged to myself that after the WRDA 2018 was passed, we would not let that happen. I instructed my team to have all guidance out by April the 15th, and we did that with the exception of two, but I am proud to tell you today that all of our guidance has been submitted to the committee.

I am committed to ensuring that the United States Army Corps of Engineers continues to do what it does better than any other organization in the world, identify the best ways to manage, design, construct, restore, and protect water resources and its infrastructure. My goal is to achieve the highest economic, environmental, and public safety return for the Nation, which will benefit all our citizens.

Thank you for inviting me here today, and I look forward to taking any of your questions.

[Hon. James' and Major General Spellmon's prepared joint statement follows Major General Spellmon's oral remarks.]

Mrs. NAPOLITANO. Thank you, Mr. Secretary.

Major General Spellmon, you are recognized.

General SPELLMON. Good morning, Madam Chairwoman, and members of the committee. Thank you for the opportunity to speak with you today about the implementation of recent Water Resources Development Acts, execution of the Corps Civil Works program, and our ongoing flood fights across the Nation. Again, my name is Major General Scott Spellmon. I'm the Corps Deputy Commanding General for Civil Works and Emergency Operations.

I would like to first acknowledge the widespread devastation and serious impacts this year's flooding is creating for many people across the country. The Assistant Secretary and I have witnessed these impacts first-hand during our many visits to the field. Throughout our Corps personnel have been working tirelessly to help mitigate the effects of these events by providing assistance to States and local communities.

This year's flood season continues to challenge many Federal and State agencies as well as many local governments. At our highest point, we had over 400 river gauges indicating flood stage across the country, and over 183 reported ice jams in our Nation's rivers. In the Ohio River Valley, this past fall and winter were the wettest on record in the past 124 years and we have seen record reservoir levels in our Cumberland River projects. Our personnel industry had been in the flood fight for over 200 days and counting.

Our Mississippi Valley division has been in the flood fight on the Mississippi River for the past 260 days and will continue at least for the next several weeks. For the first time in its 88-year history, we opened a Bonnet Carré spillway twice in one season, which has now been operating for 106 days. Within the Mississippi Yazoo Backwater Delta, record water levels have impacted thousands of acres of agricultural land as well as many communities.

Upstream of St. Louis, the Mississippi reached its second highest stage ever recorded, and even this week, we are closely monitoring a low pressure system in the Gulf of Mexico that may evolve and produce a surge elevating the lower Mississippi River to 19 feet above sea level as early as this Friday.

On the Missouri River, the flood event that began on March 13th was a combination of rainfall, warm temperatures, and rapid snow melt all on top of saturated and frozen soil. This condition covered a large area, including central and western Nebraska, southeastern South Dakota, western Iowa, and portions of northern Missouri and Kansas.

The ensuing runoff drained into uncontrolled tributaries that were already subject to ice jam conditions as I mentioned, and this combination of events led to record discharges on a number of rivers where we reached major flood stage in less than 48 hours. This event is still ongoing, as prolonged rainfall continues to bring river stages well out of bank from Omaha to the Missouri's confluence with the Mississippi just above St. Louis.

On the Arkansas River, the flood event that began in May was also due to intense and prolonged rainfall again on top of saturated soils that led to record stages and flows from Tulsa, Oklahoma, to the river's confluence with the Mississippi. This event is also ongoing as well, and many of our reservoirs in this region have also established new pools of record.

In many of these watersheds, our Corps dams and reservoirs have prevented even more significant flooding downstream of those projects, averting millions of dollars in additional property damage as well as saving countless lives. Today, I want to assure the committee that our Corps' number one priority in all of our operations remains life and public safety as we continue to address the many flooding challenges across the country. As of this morning, we have identified over 160 levee breaches that require repair and we are working with States and non-Federal sponsors to expedite that work.

We also want to thank this committee and the Congress for the authorities and flexibilities it has provided the Corps to address these and many other challenges. These tools accompanied with record levels of Civil Works appropriations for the Civil Works program are making a positive difference. You may have heard our Chief of Engineers speak to the ongoing efforts to revolutionize the way we do business as an enterprise. The authorities provided by this committee continue to enable his initiative.

We are working to modernize the traditional delivery of the Civil Works program by utilizing innovative tools to accelerate project delivery, exploring alternative financing approaches and streamlining our internal processes to improve permitting and regulatory actions.

I look forward to highlighting these improvements to our project delivery during our session today and welcome any questions that you may have. Thank you.

[Hon. James' and Major General Spellmon's prepared joint statement follows:]

Prepared Joint Statement of Hon. R.D. James, Assistant Secretary of the Army for Civil Works, Office of the Assistant Secretary of the Army (Civil Works) and Major General Scott A. Spellmon, Deputy Commanding General for Civil and Emergency Operations, U.S. Army Corps of Engineers

Chairwoman Napolitano, Ranking Member Westerman and distinguished members of the committee, thank you for the opportunity to be here today to discuss the U.S. Army Corps of Engineers (Corps) Civil Works program and the status of implementation of recent Water Resources Development Acts.

I have been in the Assistant Secretary of the Army for Civil Works (ASA(CW)) position for 15 months and my goals today are the same as they were when I started, to focus on outcomes, over process, in order to make the best use of the available funds. Since last year I have had the pleasure to meet with most of you one on one to discuss your views on the Corps Civil Works program. That input is appreciated and I remain committed to working with each of you.

The Fiscal Year (FY) 2020 Budget provides over $4.8 billion for the Corps, with a focus on investments that will yield high economic and environmental returns or address a significant risk to public safety. This Budget relies on a foundation of strong relationships between the Corps and local communities, which allow us to work together to help manage, develop, restore, and protect their water resources. The Budget focuses on the highest performing work within the three main mission areas of the Corps, which are:

- commercial navigation;
- flood and storm damage reduction; and
- aquatic ecosystem restoration.

The FY 2020 Budget supports a Corps program that has a diverse set of tools and approaches to working with local communities, whether this means funding projects with our cost-sharing partners, providing planning assistance and technical expertise to help communities make better informed decisions, or participating in the national and international conversations on how to best address our future water resources challenges. The Budget helps us maintain and improve our efforts on resiliency and sustainability—one of the challenges associated with the ways that we have used our water and related land resources in the past.

The Budget also funds two new, innovative programs in the Construction account:

- $150 million for the Water Resources Reform and Development Act of 2014 (WRRDA 2014) Section 1043 Non-Federal Construction of Federal Projects program, under which the Corps would transfer appropriated funds to non-Federal sponsors who decide to construct a project on their own. This approach will improve project delivery and achieve cost savings; and
- $150 million for the Innovative Funding Partnerships program, which would be used in conjunction with funds voluntarily provided by non-Federal interests in excess of the non-Federal cost share to accelerate the completion of construction of specifically authorized projects.

In addition, the Budget proposed to extend the authorization for Section 1043 of WRRDA 2014, as amended, which under current law expired on June 10, 2019.

Since the enactment of the Water Resources Development Act of 2018 (WRDA 2018), the Chief of Engineers has issued a report with recommendations on the following eight proposed water resources projects:

- Little Colorado River (Winslow), Arizona
- Sacramento-San Joaquin, Delta Islands and Levees, California
- Anacostia Watershed Restoration, Prince George's County, Maryland
- Pawcatuck River, Rhode Island
- City of Norfolk, Virginia
- Souris River Basin, North Dakota
- Great Lakes & Mississippi River Interbasin Study—Brandon Road, Illinois
- Yuba River Fish Passage (Englebright and Daguerre Point Dams), California

Since receiving my appointment to be ASA(CW), I've focused on how the Corps executes its funds. This involves identifying the highest priority investments and ensuring that we finish that work in a more timely and efficient way. This approach will ensure a better return on taxpayer's investment and better the lives of Americans. Under my oversight and direction and with the help of Lieutenant General Semonite and his team, the Corps is committed to working on improving the performance of the Civil Works program. The Corps also is using its engineering expertise and its relationships with project sponsors and stakeholders to develop new approaches to address some of the most pressing water resources challenges facing the Nation.

Improving performance and timely delivery of quality products continues to be one of my highest priorities. To that end, we have completed the guidance for all provisions of the Water Resources Development Act of 2016 and the WRDA 2018 that we determined will require such guidance.

I am committed to ensuring that the Corps continues to do what it does better than any other organization in the world, which is to identify the best ways to manage, develop, restore, and protect water resources. Our goal is to achieve a high economic, environmental, and public safety return for the Nation, which will benefit all Americans.

Thank you for inviting me to be here today. I look forward to your questions.

Mrs. NAPOLITANO. Thank you, General Spellmon and Secretary James for your testimony. We will now recognize individual Members for up to 5 minutes each for questions, and I will start with the questions to both of you.

In many parts of the country, we are experiencing more extreme weather events. The Midwest is flooding, and outside this year, the West has been in extreme drought other than for a little bit of water. How is the Corps century-old infrastructure adapting to deal with the changing conditions of today?

Mr. JAMES. Ma'am, we are taking that very seriously in all that we are trying to do. We have initiated several different databases, and we are working with the other agencies like the USGS, the monitoring. This past budget, I entered $3 million for gauges in the upper Mississippi River System looking at the snowpack and plains pack in that system.

I intend to try to do the same thing in other systems as well as California, but we are not standing by idly and building as usual. We are trying to keep an eye to the future and build in a way that what we do build will serve us all for years to come.

Mrs. NAPOLITANO. Well, with recent seismic events, were there any problems that you encountered that you were going to have to look at for all dams?

Mr. JAMES. Which events, ma'am?

Mrs. NAPOLITANO. The earthquake in California.

Mr. JAMES. Oh, my goodness. I can't say that I am an earthquake expert. I do say that anything we build in the future, and I am not sure that we haven't done it in the past, but in the future, as far as infrastructure from the Corps of Engineers, we built for seismic resistance. Even though I live on the New Madrid earthquake fault, I am still not an expert on earthquakes.

General SPELLMON. So, may I, if I could just add. We have had our structural, our geotechs, our engineers out on the three dams that are closest to the most recent earthquakes in California: the Isabella Dam, the Success Dam, and the Terminus Dam, and we have had no significant issues to report.

Mrs. NAPOLITANO. Can you talk about the Corps role in the forecast-informed reservoir operations—FIRO—in helping Corps projects adapt to meet current and future needs for the communities they serve?

General SPELLMON. Yes, ma'am. So, I will start. Our intent is to continue our partnership with the State and local entities as well as academia as we advance this pilot. This pilot began in 2014 and we will wrap it up this year. We are, frankly, excited about the early results we had at the atmospheric river, as you recall, ma'am, back in February, and we were able to use some of the data and

advanced monitoring technology to actually make reservoir decisions long before this water hit the ground.

So, we will wrap up that report here this year and we will look for opportunities where else in the Nation that this technology may apply.

Mrs. NAPOLITANO. How soon can we expect the ability of the Corps to work this program into other types?

General SPELLMON. Yes, ma'am. So, the technology that I had a chance to briefly talk with you before the hearing. The technology that we are talking about is very good for these types of conditions that we are talking about on the west coast. We are not certain yet scientifically that this same technology will apply to some of the weather patterns that we saw this year, say, over Arkansas or Oklahoma or the upper Midwest. We have more work to do.

Mrs. NAPOLITANO. Thank you. Secretary James, your testimony highlights a provision that reserves $150 million for projects where the non-Federal sponsors willing to contribute more jump the line. How does this innovative partnership help small, rural, and disadvantaged communities partner with the Corps?

Mr. JAMES. I think the purpose of this process and this innovative funding will allow people that have the money to do that to move forward and do it. I am not sure it will put them in front of the line of those like myself that has to stay under the original cost share agreement. That is not what it is intended for. I don't think it will work that way.

I am still working with the administration right now to get a better handle on how they want this program to work. When you read it, it doesn't look too good. Like, if you have got the money, put your money up and you can move out, but I am not sure. I don't think that is what they intend for us to do, but I am working on finding out.

Mrs. NAPOLITANO. Well, would it be sure that the small communities are not disadvantaged?

Mr. JAMES. Yes, absolutely. That is one of my concerns, not with this particular proposal by the administration. That doesn't concern me too much, but overall, I am concerned about the areas of this country that do not have the money to put up for infrastructure and for protection. I do not want to leave those people out. They deserve——

Mrs. NAPOLITANO. We should not. We should not leave them out.

Mr. JAMES. No, ma'am.

Mrs. NAPOLITANO. Thank you, sir.

Mr. Westerman.

Mr. WESTERMAN. Thank you, Chairwoman. Secretary James and General Spellmon, thank you not only for your testimony today, but for the job you do and your service to our country in an area that is extremely important.

When we talk about safety and the economy and the environment and all those things, and as I have mentioned earlier in my testimony, we did see unprecedented flooding on the Arkansas River this year. You know, to put it in perspective, the river typically flows around 40,000 cubic feet per second. When it gets to 80,000 cubic feet, you really don't want to be on a small boat in the river or maybe even on the river at all, but we were seeing flow

rates of 500,000 to 600,000 cubic feet per second. Just an enormous amount of water coming down the river.

I was with the Governor and others from our congressional delegation on the bridge in Fort Smith there on the Arkansas-Oklahoma line and really was, with all the flooding, the intensity of it, as an engineer I was pretty impressed with the way that infrastructure held up, and when we saw in the magnitude of 1,000 homes flooded, we saw a lot of farmland flooded, but we saw relatively few levee failures and the infrastructure held up better than I think anyone expected for the condition it was in.

General Owen and some others there worked well with our State, but in the aftermath of that, at the end of June, Governor Hutchinson ordered a review of Arkansas' levees and created a task force to study and analyze the condition of our levees and Secretary James, I know you mentioned it is one of your objectives to work closer with the local officials, and you know, that is statewide in the districts as well, but how is the Corps working with Arkansas and other States who have seen their levee systems damaged to conduct a comprehensive assessment of the levee system?

Mr. JAMES. I will let General Spellmon talk to that, but I can tell you right now, we aren't able to do a lot because the water hasn't fallen enough for us to get in there and get the soil probings and all we need to see what needs to happen.

I can assure you one thing that will happen without any technology or scientific data. When these waters go down in all of these systems, we are going to have major levee slides that are going to have to be prepared before the next flood season. Any time we have water as high as it has been for as long as it has been, then when the water goes down, geotechnically, something happens to that soil and it slides off on the riverside of that levee, and that hasn't been reported to you yet at all, but it will be coming because it will happen.

I will let the general talk to you, sir, just a moment about how we are moving out so far.

General SPELLMON. Yes, sir. We have to do this hand in hand with local sponsors, not Federal sponsors, who actually own and operate these levees, whether Federal levees or non-Federal levees inside the rehabilitation program so we can, at the appropriate time, get the right designs done and move the money to get these repairs done as expeditiously as possible.

Sir, I would just state today, we have $1.9 billion in known damages on our Nation's levee systems. That is primarily in the reach from Omaha down to Kansas City where the water has fallen enough for us to do the detailed assessments, but from St. Louis, sir, all the way down to New Orleans, and then certainly in your region, we have got to get this water down so we can do the detailed work, and come back to the Secretary and the Chief with our requirements.

Mr. WESTERMAN. But you are all hands on deck working with the State and local officials, and——

General SPELLMON. Yes, sir.

Mr. WESTERMAN. Not just in Arkansas, but in other areas as well.

General SPELLMON. Everywhere, sir.

Mr. WESTERMAN. All right. So, last WRDA I worked with Mr. Garamendi to pass a clean reauthorization of the National Levee Safety Initiative to extend its authorization to 2023. Given the severity of flooding and the impacts to our Nation's levees just these past few months, it is essential for the Corps to develop more efficient methods to inspect and collect and maintain data in the National Levee Database.

I understand you are testing some pilot programs. I am out of time, but I hope that somewhere, you will be able to talk about innovations in the levee programs.

General SPELLMON. Yes, sir, and we would welcome the opportunity to come see you one on one and walk you through where we are and where we are going with that program.

Mr. WESTERMAN. I yield back, Madam Chair.

Mrs. NAPOLITANO. Thank you, Mr.—what is your name?

[Laughter.]

Mrs. NAPOLITANO. Mr. Westerman.

Mr. Graves, you are recognized.

Going to my side. Ms. Mucarsel-Powell, you are recognized.

Ms. MUCARSEL-POWELL. Thank you, Madam Chair.

Thank you and good morning. First, I want to thank the Army Corps for accepting my invitation to come down to south Florida to Monroe County for that public meeting to understand the effects of the Lake Okeechobee and how you regulate that lake and how that effects the livelihood in south Florida.

So, thank you for that, and as you know, the Everglades is such an important and critical component of water quality and for the livelihood for Floridians. The success of restoring the Everglades is really going to rely on partnerships and collaborations between State and Federal agencies, including the Army Corps, and central to this management is the inflow that comes into Lake Okeechobee, but also managing the discharges from the lake.

I find it completely unacceptable that the lake has released contaminated water after Congress has appropriated hundreds of millions of dollars for Everglades restoration in the past 19 years, and that the communities living in the east and west of Lake Okeechobee have received high levels of green-blue algae that have killed fish, that has sent children to the hospitals. We are experiencing such a crisis, a public health crisis in our communities because of the high toxicity that is coming from the Lake Okeechobee.

Also, in the South, hundreds of thousands of acres of seagrass has died because of low levels of water coming down from Lake Okeechobee. So, clearly something is just not working, and I know that there is a long history. We can talk about what has happened in the past, but I want to take this opportunity to understand what we need to do and to do a better job of protecting the public health as we are regulating the lake.

So, General Spellmon, I know that you mentioned that your mission and your goal is, or the priority is the life and public safety of your communities which I think I would assume public health is a part of that as well. So, who do you think needs to be at the table involved in making these decisions managing the health of the lake and the discharges, and what can the Corps specifically do to avoid another disaster, which we saw last summer?

General SPELLMON. So, the first question. Everyone has to be at the table. The Federal partners, not just the Corps, but also all the State and local agencies, and we think we have that in our governance meetings where Colonel Kelly makes the decisions on releases.

I would just say also as a general statement that the Corps is all in. We are going to use all of our operational flexibility from our water control manual at Lake Okeechobee to our construction capabilities as well as our research capabilities to help the State deal with this water quality issue.

There are no short-term solutions, ma'am, to the broad problem that you outlined, but there are a number of projects ongoing all around that lake that will contribute to the long-term solution for your constituents.

Ms. MUCARSEL-POWELL. Who is right now responsible for measuring the algae levels in the lake?

General SPELLMON. Measuring?

Ms. MUCARSEL-POWELL. The levels of toxicity in the lake?

General SPELLMON. Yes, ma'am. So, I think that is probably the Florida Department of Health. Possibly the Centers for Disease Control. The folks in the medical community that deal with water quality.

Ms. MUCARSEL-POWELL. And are you in close communication with these departments?

General SPELLMON. Yes.

Ms. MUCARSEL-POWELL. Would you be able to provide to me a plan, a communication plan, on once you understand the levels of toxicity what the next steps are before you decide to release that water.

General SPELLMON. Yes. We can share with you how we govern our governance process that is the decisionmaking that our district commander goes through when he is deciding where and when to release.

Ms. MUCARSEL-POWELL. OK, and what do you think we can do in Congress at the Federal level to help reduce the risk of the toxicity, both in the short term and the long term as we release the water into our communities?

General SPELLMON. Yes, ma'am. As I said, there is a number of, probably about 64 in total in the south Florida ecosystem restoration program that will need continual investment over the ensuing years so that we can get the infrastructure in place to help the State deal with this water quality issue.

Ms. MUCARSEL-POWELL. Will the $200 million that I requested that has been approved and appropriated to continue the Everglades restoration project be helpful, and how quickly can we expect the completion of that project?

General SPELLMON. So, yes, ma'am. Absolutely. It's going to help us expedite this program. So, with the $200 million and the President's budget request, we will complete the Kissimmee River restoration next year. We will continue our construction and oversight for the C–43 West Storage Basin. We will continue our construction oversight in design for the Indian River Lagoon South on the east side of Lake Okeechobee. That project will be complete in 2022, and of course, we will continue our development and planning with

the South Florida Water Management District for the design of the Everglades Agricultural Area Reservoir. That is all next year.

Ms. MUCARSEL-POWELL. Thank you, General.

I yield back my time.

Mrs. NAPOLITANO. Thank you, Ms. Mucarsel-Powell.

Mr. Graves, you are recognized.

Mr. GRAVES OF MISSOURI. Thank you, and just I want to follow up on Ranking Member Westerman. You said that your preliminary numbers between Omaha and Kansas City are $1.9 billion?

General SPELLMON. Yes, sir.

Mr. GRAVES OF MISSOURI. And——

General SPELLMON. That is for the levees that we can get down to the toe and actually do adequate assessments. We know there are many more levees that have——

Mr. GRAVES OF MISSOURI. Right——

General SPELLMON [continuing]. Been overtopped and damaged throughout the country.

Mr. GRAVES OF MISSOURI. And obviously that it is going to take a little while with those assessments. Do you have any idea what that number might rise to?

General SPELLMON. Sir, I don't. It is still raining. We have got a large storm coming in here this weekend. We have still got a lot of flow in the upper Missouri River that has yet to make its way through the basin. Sir, I don't have a good estimate for you.

Mr. GRAVES OF MISSOURI. So, that is just on those breaches that you have been able to get into, then.

General SPELLMON. Yes, sir.

Mr. GRAVES OF MISSOURI. And real quick, and I don't know if this is for the Secretary or not, but as far as the Midwest supplemental goes, when is that money going to hit the ground? We have kind of got a clock ticking out there.

Mr. JAMES. I am sorry, sir. I didn't understand.

Mr. GRAVES OF MISSOURI. The Midwest supplemental dollars that were approved. Do you know when that money is going to be distributed?

Mr. JAMES. That money has been separated into different line items at this time. The general may have a paper on that. I don't, but as soon as we can get our hands on it, which we don't yet.

Mr. GRAVES OF MISSOURI. OK.

Mr. JAMES. I don't have the money yet, but it is hopefully pending quickly, but we can start work on some areas pretty soon, but doggone it, it is the rivers are still just so high there is not a lot of work we are going to be able to do. Like, if we were going to repair a levee, how are we going to get the bar area?

Mr. GRAVES OF MISSOURI. Yeah, no. I understand.

Mr. JAMES. Yes, sir, and so, but the money is coming, but we don't have our hands on it, and I am not sure how it is divided up.

Mr. GRAVES OF MISSOURI. OK.

General SPELLMON. Yes, sir. So, that $3¼ billion in this, the FY 2019 supplemental that is coming to the Corps. About $2 billion of that, sir, we are able to use nationwide to deal with some of the damages that we have seen to the levees, and then also of our Corps projects, our locks and dams.

The investigations account and the construction account, those are tied to States and regions that were impacted by last year's hurricanes, Michael and Florence, and also the typhoons out in the Pacific.

Mr. GRAVES OF MISSOURI. Is there going to be another supplemental request? I am assuming there will be as we move forward.

Mr. JAMES. There will have to be. You see how that is split——

Mr. GRAVES OF MISSOURI. Yeah——

Mr. JAMES [continuing]. Up already, and I can tell you now that might not even take care of Missouri, let alone Arkansas. The rivers now, not the States.

Mr. GRAVES OF MISSOURI. Yeah.

Mr. JAMES. The Arkansas River and the Mississippi River. It is just hard to tell, but if I were a betting man, I would bet we will have to have more money to attack the damage that has been done.

Mr. GRAVES OF MISSOURI. Thanks, gentleman.

Thank you, Madam Chair.

Mrs. NAPOLITANO. Thank you, Mr. Graves.

Mr. Garamendi, you are recognized.

Mr. GARAMENDI. Thank you, Madam Chair.

Secretary James and General Spellmon, I think everyone on this committee recognizes the extraordinary pressure that you are under. The flooding across the Nation from the west coast all the way to the east coast and everything in between. We appreciate your service. We appreciate the challenge that you face.

I will draw your attention to the reality of change and that the way in which we have conducted flood operations in the past has been based on historic situations. We are no longer in such a situation. There is a project that has been ongoing in California now for several years called the forecast-informed reservoir operations program, drawing the attention of the committee to that, this is based upon real-time information that is now available from satellites and other technologies that are available, and we appreciate the implementation of that on the rivers in California, and I suspect it may be applicable across the Nation.

Now, I have a whole series of questions that I am just going to submit for the record. No use taking the time of the committee or your time here today. Secretary James, projects in California in the Sacramento Valley do thank you for coming out—both of you for coming out and observing what we are doing in the Central Valley.

Interesting article in the Sacramento Bee. If the same downpour that hit Washington were to hit the American River, water would be 30 feet deep in Sacramento, so we know we have problems across the Nation. Specifically, General Spellmon, section 204 and section 1043 provide flexibility for local agencies to conduct programs. Without going into the detail, could you please explain why the Corps is so reluctant to move aggressively using these authorities to devolve programs and construction to the local agencies?

General SPELLMON. Sir, I would say we do want to aggressively use them. We are after anything, any authority or capability that will allow us to, as the Secretary would say, move dirt or get to construction or complete projects quicker. So, sir, if there are examples in your district where we are not doing that, we would like to know and to take action.

Mr. GARAMENDI. We will so inform you. There has been a reluctance to move forward aggressively using these programs, and if that were to happen, projects would be completed quicker, possibly sooner. I can give you one specific example on the Feather River, where the quarry did not allow the local agency to undertake the project, when it would have saved significant money. Probably an issue for the rest of the Nation as you deal with the flooding that is occurring in the Midwest.

I will leave it at that. I do draw the attention of the committee to the reality of change and the necessity for the flood operations to reflect the new reality and to use information that is now available from multiple areas, satellites to other technologies.

With that, I yield back.

Mrs. NAPOLITANO. Thank you, Mr. Garamendi.

Mr. Graves, you are recognized.

Mr. GRAVES OF LOUISIANA. Thank you, Madam Chair.

Secretary James, General Spellmon, I want to thank you very much for being here today and thank you for your testimony.

I think you are familiar with the watershed. The Mississippi River watershed. Certainly, Secretary James, you spent a good bit of time working on that in your career. Right now, we are facing a scenario, as you heard other Members talk about how in Baton Rouge, in my hometown, we are seeing 1.3 million cubic feet of water pass per second through that river system, one of the largest watersheds in the world.

We now, as you know, have a tropical depression in the Gulf of Mexico that appears to be coming up in the next few days that, by some model projections, is going to cause the Mississippi River levees to overflow because of that higher storm surge coming in at the bottom of the levee system.

We are draining water from Montana to New York to Canada, all through this huge watershed. What do you say to the folks in Louisiana? What do you say to them that we are draining water from all of these other States? As you know, the inputs into that river system were minimal from Louisiana and because of this huge amount of water that is coming from them, coming from all these other States, and now the storm surge is going to cause overtopping.

It is not our water overtopping. It is everybody else's water overtopping. We have seen impacts to our fisheries, our commercial fisheries, and our recreational fisheries as a result of the Bonnet Carré spillway. And General, as you mentioned in your testimony, normally open once every 10 years since the 1930s when it was built. We have opened it four times in the past 4 years. As you mentioned, the first time in history twice this year. Twice in 1 year. What do you say to people down there when we are experiencing the flooding because of what is happening in the upper basin?

Mr. JAMES. Well, if it wasn't so serious and if I didn't think it would be taken the wrong way, I would say, "You better move," but it is serious and there is so much industry and economic return to this Nation from Baton Rouge to New Orleans, and also over in the Atchafalaya, some of the other estuaries down there that we can't say, "You better move." That would be very silly, so what we have

got to do is start addressing the problems based on, like, Mr. Garamendi said, on what we know now, not what we knew in the 1930s, the 1940s, and in the 1950s.

Mr. GRAVES OF LOUISIANA. And Mr. Secretary, we are giving you all an opportunity to do that and the WRDA bill became law last year. We included a provision all over every controlled structure looking at how to do a better job managing the water on Atchafalaya, Red, the Mississippi River system, and better utilize old river control structure. As I understand, you are looking at a 3-year study. I just don't think we have 3 years.

You heard the urgency from Ranking Member Graves and others, and Ranking Member Westerman about this issue. I don't think we have that kind of time, and I want to urge you to move quickly, and you are right. We can't move. We are 1 of the top energy producing States in the Nation, top commercial fisheries producing State in the Nation, 5 of the top 15 ports in the Nation. You can't replicate this capacity elsewhere.

I want to pivot and go off what Congressman Garamendi and I know Congressman Rouda who is here has concerns about this as well. You mentioned it in your testimony. Section 1043. The Corps of Engineers has $100 billion backlog in authorized projects. One hundred billion dollars.

One of the ways we can help to speed up the implementation of these projects and help to break down this backlog is to use section 1043 which provides for local sponsors, State and local sponsors to carry the project out. This became law in 2014. The guidance was just issued in June, nearly 4 years later, and so I think that I actually want to follow on Congressman Garamendi's comments.

It does appear that maybe the urgency is not there, and then as you know, in 2018, WRDA bill, Congress extended it. The implementation guidance, we did extend it. There is one technical issue in the extension that I think has become a problem, but if there is a desire on the part of the administration to continue this and to utilize this as a tool to address this backlog and deepening rivers and improving flood protection, ecological restoration and other Corps functions, we need to figure out how to get to yes, not how to get to no.

Can you talk a little bit about how we are going to move forward on 1043 and what some of your experience is with McCook Reservoir in Harris County using 1043 to implement?

Mr. JAMES. The experience so far is very good. We have not had any problems. Now, McCook was done a little differently because it was a new venture. The way we did that we won't be doing again I don't think, but as far as Harris County, they are tickled to death with it. It is letting them do what they needed to do, own those reservoirs down there. It is a good tool for the people that can afford it. There is no doubt that——

Mr. GRAVES OF LOUISIANA. Mr. Secretary, the 140-page guidance that you all issued in June basically says that you all just acknowledged it. It basically is going to be useless at this point because the program expired, yet we did extend it in WRDA 2018. I just want to ask you if you all could go back, work with your attorneys, figure out how to get to yes, not to no, because this is going to be an important tool for us moving forward.

I yield back.

Mrs. NAPOLITANO. Thank you, Mr. Graves.

Ms. Finkenauer.

Ms. FINKENAUER. Well, thank you, Assistant Secretary James and also Major General Spellmon. It is great to have you guys here with us today. So, I represent Iowa's First Congressional District right there on the Mississippi. So, I have actually quite a few questions and if in the interest of time if you can keep it brief, that would be great.

First, when I met with Colonel Sattinger from Rock Island back in March, he told me the Cedar Rapids eastern floodwall project has been fully funded and construction will start this October. Obviously, great, great news for our community that was devastated by flooding back in 2008 and desperately needs that floodwall done.

I was just wondering if we could get an update from you on the timeline for this project and if there are any remaining hurdles to getting that job done?

General SPELLMON. No, ma'am. No hurdles that I am familiar with. This year, we have already issued three architect engineer task orders to commence the design, and as you have mentioned, we will issue the first two construction contracts by the end of the fiscal year.

Ms. FINKENAUER. Great. Thank you so much, and next, I want to ask about the Navigation and Ecosystem Sustainability Program. Obviously, NESP. This program is obviously critical for farmers and other shippers in my State who use the Mississippi to move their products. Congress authorized this project over a decade ago, but it keeps getting pushed back, so we know there is a backlog of waterways projects, but this year, the President has requested a 31-percent cut to the Corps.

To be clear, the Mississippi River is our competitive edge, especially at a time when our farmers are getting hit on all sides due to flooding, but then also because of the trade war, and this is a time where we need to be investing more in our waterways and our infrastructure, not less. Can you help me understand, Secretary James, why the backlog of these projects, including NESP, has been underfunded and why NESP hasn't moved forward more quickly?

Mr. JAMES. I have been familiar with NESP in my prior life as a member of the Mississippi River Commission. In that life, I really felt like we handled that wrong. Since I got here in this job, I have discovered that the Congress and the industry wants to do it as it is: navigation, ecosystem, restoration, sustainability; together.

Ms. FINKENAUER. OK.

Mr. JAMES. And all those years, I didn't think that was a good idea. I thought we should have them separated so they could be funded separately. Now, I got here, and I found out that is not what the people want, so I don't even talk about that anymore, but let me address the backlog just a minute, Madam Chairman.

Mr. Graves said $100 billion backlog, and that is what we put out.

Ms. FINKENAUER. Mm-hm.

Mr. JAMES. I am going to be working on that because I don't believe that. I don't believe we have got a $100 billion backlog. We

have got projects that have been authorized for years and years and years. I don't consider those backlog. I only consider projects that have been authorized and appropriated at least $1 that means the Congress is willing to put its money where its mouth is, and I call that backlog. It still——

Ms. FINKENAUER. And Secretary James, I am sorry. I am just, in the interest of time, to follow up on that, if it is not the backlog or if it is not the money, what do we need to do as a Congress to move NESP forward?

Mr. JAMES. So far, it has been the lack of will. That is why it hadn't moved forward, and it is very much needed.

Ms. FINKENAUER. As——

Mr. JAMES. Those locks and dams in the upper Mississippi River are falling apart.

Ms. FINKENAUER. They are, and I mean, it is authorized over a decade ago, and so, I know this is, you know, your oversight on this as well, and we have got to make sure that we are doing this, and we are happy to work with you any way we can to make sure that these projects move forward. They are desperately needed and thank you for your time as well.

And lastly, I do want to follow up as well just about flooding in general. As you know, Iowa farmers endured months of not being able to move their goods down the Mississippi because of the prolonged flooding. This is only going to get worse. You know, these so-called 500-year floods are now happening every 5 years now.

Major General Spellmon, is the Corps ready to manage the flooding in the Mississippi River, particularly given the need to balance the Corps' other functions like navigation and recreation? If we were to redesign how the Army Corps of Engineers manages the Mississippi River watershed, what do you think needs to change or actually work differently so you can more effectively control for flooding?

General SPELLMON. Yes, ma'am. So, after we get through this next flood fight, every year, we will conduct an after-action review after we get through this event to see what are the opportunities where we can further improve our operations up and down the basin.

Ms. FINKENAUER. Would it be helpful to have some research on that and—? OK. Great. Great. Thank you so much and thank you both for your time today. This is obviously very important, and I look forward to continuing these conversations.

Thank you.

Mrs. NAPOLITANO. Thank you, Ms. Finkenauer.

Mr. Weber, you are recognized.

Mr. WEBER. Thank you, ma'am. I appreciate the opportunity. I am from the Texas gulf coast. As Secretary James knows, Hurricane Ike in 2008 hit, Hurricane Harvey a couple of years ago, and my three coastal counties were ground zero for Harvey flooding.

The implications are just absolutely astounding and Secretary James, I was glad to hear you say in your earlier comments that you feel like you have identified, at least, and feel like it needs some fixing, obviously, that the Corps has gotten away from working with local partners. You also said that improving performance was one of your highest priorities, and that is good news.

The Texas gulf coast, and one of my good colleague's friends down there, Sally, a blogger from Galveston, keeps me reminded on how important this is because we actually—she has got a sheet for us and I want to make sure that you all are following the study that is being done about coastal barrier protections. Some call it the Ike dike. And this affects not just our district but all across the country, and there is a whole lot of reasons for that, but just a little history.

The WRDA of 2007 actually authorized the Army Corps to develop a coastal Texas ecosystem protection and restoration plan to determine the feasibility of carrying out projects for flood damage reduction, hurricane and storm damage reduction, and ecosystem restoration in the coastal areas of Texas. And like my friend from Louisiana, Mr. Graves, said, things just aren't happening enough.

A couple of facts that I think my colleagues would be interested in. In Texas, in our country, in terms of energy, the Texas gulf coast region produces 27 percent of the Nation's gasoline, 60 percent of the Nation's aviation fuel, so it has national security and national economic ramifications. We have 35 percent of the Nation's natural gas production and 42 percent of the Nation's specialty chemical feedstock.

So this has national economic implications, national security implications, not to mention there are 6 million people, families, businesses, jobs along the gulf coast that need protecting. It is not a matter of if we get another hurricane, it is when. To the general's comment about—I think he said the depression out in the gulf you are seeing now, you know, it is just a matter of time and it is going to happen.

There are some studies being done about the implications of the coastal barrier protection plan that is needed along the Texas gulf coast, and it starts at the Louisiana border and goes really all the way down the coast, but mainly in the area of the gulf coast it does all of the fuel production.

Are you all mindful of that study, Secretary James? The Army Corps is coming out with some very current stuff called the Tentatively Selected Plan, TSP. And I know that Colonel Lars Zetterstrom did a fabulous job, but people are a little frustrated about the way information was rolled out and the amount of time it was taking, and quite frankly the plan that was selected.

Is your office monitoring that situation and are you aware of the ways that they are developing that plan and what they are recommending?

Mr. JAMES. I am not, but I will be.

Mr. WEBER. OK. Well, we would love for you to reach out to them and get—I don't know what the right word is—boned up on it so that you know, because it is super, super important to our district. We have five ports on the Texas gulf coast. Some have four, but we have five.

We are the 13th largest exporting district in the country out of 435 Members of Congress. So it is huge. The Port of Beaumont moves more military personnel and equipment than any other port in the Nation. So it is huge for national security and national economic calculations.

For example, when Hurricane Ike hit in 2008, I was told by John Shimkus even up in Ohio, up in that area, that fuel spiked about 60 cents a gallon. So we want the Army Corps to be paying specific, close attention to that and make sure that that is getting rolled out in a timely fashion and to make sure that that is a priority, and we would appreciate any feedback you can give us on that.

General Spellmon, are you aware of it?

General SPELLMON. Sir, I am. So I would just say to add to your comments, this is a very large and complicated project, and the fact that we have got some energetic comments from the public and industry back on that draft study is important to us because we take that all into account, and that is just going to make that project even better when it does get to——

Mr. WEBER. What was the number of those comments?

General SPELLMON. Sir, I don't know.

Mr. WEBER. Yes.

General SPELLMON. It was thousands.

Mr. WEBER. Yes, absolutely. I am thinking it was like 8,000. But we really want to focus on the importance of that and the study that was authorized and the fact that it has huge implications not just for our area but for the Army, for our national defense, as well as our economy.

And with that, Madam Chair, I yield back 1 second.

Oh, and if I may, before I do, I want to say happy birthday to my colleague on the left, Brian Mast.

Mr. MAST. Thank you.

Mrs. NAPOLITANO. Oh, happy birthday. Thank you, Mr. Weber.

Mr. Malinowski, you are recognized.

Mr. MALINOWSKI. Thank you. Thank you, Madam Chair. I appreciate a chance to hear from our witnesses and just to reiterate our appreciation for the work that the Corps does. It is vital. It is essential. It is greatly needed. You do it with too few resources. We all make demands on you, which you strive to meet within those limited resources, and I recognize that it is sometimes a challenge.

That said, I am going to make demands on you because that is our job. And the district that I represent in New Jersey contains portions of the Green Brook Sub Basin and the Rahway River Basin. We have significant flooding challenges, particularly the Rahway River; in recent years it has inundated communities in suburban New Jersey that had not experienced that kind of flooding in past years, and we know it will happen again.

We have been working, as you know, with the Corps. Our local elected officials have been working with you for years now to try to come up with a plan to deal with this. We were working fairly well with the New York district for some years and responsibility for the Rahway River project was moved, as you may know, to the New England district.

And whether it is fair or not, I have to say there has been some frustration with that move, both the geographic distance, greater geographic distance of the New England district, and also a sense among some of our local elected officials that proposals that they are sending up are being rejected, and not just rejected, but without the sort of feedback and input that would help us figure out a way forward.

So I think my first question is just I am hoping to better understand why the management of the project was moved from New York to New England, and then perhaps we can take it from there.

General SPELLMON. Sir, a great question. And this study has been ongoing for some time. The team from New York district, they outlined 17 alternatives; they have 17 alternatives to get after this particular problem set in your district. And we were having a lot of trouble just getting to agreement with the non-Federal sponsor on options that would work that came back that were economically feasible, meaning that they had a benefit-to-cost ratio above 1.

So this happens from time to time when we are just not seeing forward progress. We will move and to try to get another set of eyes, another set of leaders on the problem. I am taking notes on the frustrations that you have shared on New England district and I will jump on that, sir.

Mr. MALINOWSKI. Thank you. We are—I mean, you should expect another proposal from the local sponsors, from the mayors council that has been working on this. And again, I am not asking for any bending of the rules or special treatment for us. I think we agree that this is something that needs to be dealt with because the flooding will continue to happen.

I am asking for some personal attention from you and obviously, if there is anything that my office can do to help speed this along, to help if there is any communication difficulty, we stand ready to help. It is a huge, huge priority for me and for the people that I represent.

So thank you and let's stay in touch. If I can have your commitment to do that, I will be very, very grateful.

General SPELLMON. Yes, sir.

Mr. MALINOWSKI. Thank you. With that, I yield back.

Mrs. NAPOLITANO. Thank you, Mr. Malinowski.

Mr. Bost, you are next.

Mr. BOST. Thank you, Madam Chair. Mr. Secretary, thank you for—over here—thank you for being here, and also, General, thank you. You can pretty well guess what question I am going to ask. As you know, I have spoken about it several times, and that is the Len Small levee that is in my district.

Let me tell you what is happening right now so we get it on the record. Dozens of landowners and homeowners can only reach their home by boat, and some of them can't reach their home at all because they can't get through the current at the level that it is moving through.

Two State highways and a number of roads in the county are submerged and some have significant damage. The current at the breach site is so strong, we have had two occasions where it has actually sucked barges traveling upstream into the breach. Twice it has happened now, but also then the other day, just this past weekend, the current ripped apart a tow and sent several barges through the breach site.

I have a news article describing what happened, and, Madam Chair, if I can, I would like to have unanimous consent to enter this into the record.

Mrs. NAPOLITANO. So ordered.

[The information is on pages 120–122.]

Mr. BOST. I have been saying for awhile that the levee breach is a hazard to navigation. The Len Small levee does not qualify because the flood prevention benefits of the levee did not produce a positive BCR. Now, we have worked with you and we have worked with this committee and we have put things together over the years. Now, I understand this has been going on not just for this flood case but it has been going on since after the holiday flood of 2015, and then from 2016, it is about four or five times I have actually spoken in this committee and on the floor showing maps of the danger of the navigational change that may occur there.

Now, let me tell you, though, that the—you know this, that the Corps has spent millions of dollars in riprap under its navigation authority to attempt to stabilize the channel. Let me also explain this: the riprap is gone. It got washed away, because unless we make the investment and figure out a way to fix it.

So the quick question that I have: now we can agree that the navigation threat is no longer just a threat, it is real. We have seen it happen. This is a problem and we have to fix it.

Now, I am going to ask, Mr. Secretary, shouldn't the Corps consider other economic benefits like commercial navigation when conducting the BCR for non-Federal levee repair, particularly when the levee structure serves multiple purposes, as this one does?

Mr. JAMES. In my opinion, yes, sir.

Mr. BOST. OK. I am looking forward to us working together to try to cure and fix this problem. The constituents and the people along the river are becoming—you know it better than anybody. That is where you are from, right—you can look across the river almost at it. And this is a situation where common horse sense has flown out the window.

We are looking at—and this is for members of the committee and to have on record. If we don't cure this problem and that cut occurs all the way across, now all of a sudden because of the change in the river level, over the 17 miles around that bend, now all of a sudden it drops that same level in 3 miles and the navigation stops. That will change the way we transport our goods, whether it is for agriculture or anything else, when we have to all of a sudden stop north of Cairo, transfer off of the barge into trucks, take it south, and then move it that way. This is not a good way to do business.

The American people can see it is an issue, but unfortunately, whether it is Congress or working with the Corps, we can't get this figured out. I am looking forward to making sure we get it figured out and we get it fixed. And I don't know what you would suggest or the general would suggest that we can do, because this isn't going away. We have got to get it fixed.

Mr. JAMES. Congressman Bost, I would appreciate it, when your schedule allows, that I could come see you——

Mr. BOST. I look forward to that.

Mr. JAMES [continuing]. And we look into this a little further. I mean, it has been approached so far like a normal levee project, low BCR, blah, blah, blah. I am not sure we shouldn't look at some of this other information.

Mr. BOST. It truly is a case where this is when people watch what we do here in Congress. They think, you know what, I am

a simple businessperson and I can figure this out, or I am a simple farmer and I can figure out how to cure a problem when it develops, but yet we have had this problem since—and I am not blaming you. I thank you for the offer. But I want the people of this committee to know and understand, we have got to start thinking properly and quit looking like the Congress that can't get anything done on issues like this.

We have got to work together and see when a problem is developing to this level so that we can actually focus and work on it. And the people in my district—the farmers there, you know, this isn't about their land anymore. Their land is gone. It is under so much sand it doesn't matter. You are not going to—you know, unless somebody wants to open up a sandpit down there when we get the levee back in place, there is just not a lot we can do there. But——

Ms. MUCARSEL-POWELL [presiding]. Thank you, your time is up.

Mr. BOST. With that, I yield back. Thank you, Madam Chair.

Ms. MUCARSEL-POWELL. Thank you. I now recognize Congressman Lowenthal for 5 minutes.

Mr. LOWENTHAL. Thank you, and my first question is to Mr. James. First, thank you for coming to our committee and describing to us the important work of the Army Corps across the Nation. But I want to take this opportunity to mention two projects in my district, which I think are moving along. I just want to mention that, maybe also ask General Spellmon also about that.

One is an ongoing study for navigation improvements at the Port of Long Beach. I represent the Port of Long Beach. And first I would like to say to Mr. James, it would be wonderful to our port complex, the port complex of Los Angeles and Long Beach, which is the largest container port complex in the Western Hemisphere—40 percent of the goods of the Nation come in and out of L.A.-Long Beach—if you would come and visit our port complex.

The Army Corps and the L.A. district in particular have been tremendous partners to our port complex, and especially now I am talking about the Port of Long Beach, ensuring that the port remains a key component or a key or a vital component in the global supply chain.

What we are talking about are improvements that will enable the safe navigation of these megaships which now have been developed. And so, but we need really help in making sure the navigation, that they can come in and out of our harbor. And now, because of the size of the ships, they have to wait until there are tide windows to safely operate. And so I just want to alert you to that; that is moving through the process.

In addition I am also very proud to represent Orange County, or parts of Orange County, which have experienced substantial population growth in recent decades, and flood control improvements along the Westminster watershed can help to prevent billions of dollars of damage during significant flood events and they are going to save my constituents millions of dollars of flood insurance premiums. And so I am hoping that we can have the Chief's Report signed for that project so we can authorize the needed improvements in the WRDA bill next year.

But my question is a little different that I want to ask you. In the past two WRDA bills, Congress has included provisions to encourage the use of natural infrastructure for Army Corps projects, but these project alternatives often face challenges because some of their benefits are difficult to quantify. So the first question is can you tell me how the Army Corps currently calculates the cost effectiveness of nature-based infrastructure, and has the Corps been working to develop better evaluation methods for natural infrastructure?

Mr. JAMES. Congressman, if it is OK, I will let General Spellmon take that.

Mr. LOWENTHAL. That is fine.

Mr. JAMES. Because I am not cognizant of it.

Mr. LOWENTHAL. OK. General Spellmon, we are talking about now——

General SPELLMON. Sir, I had a great visit.

Mr. LOWENTHAL [continuing]. Looking towards natural kinds of infrastructure.

General SPELLMON. Yes, sir. I had a great visit out to your district in early January. In my previous assignment out in the Northwest, I had the opportunity to implement some natural-based infrastructure in some of our flood-control projects, and I do look forward to the opportunity in doing that in other parts of the Nation as well.

Sir, I would have to have our economists come in, and I would be happy to do that, to come see you and walk you through the math on how we calculate the cost effectiveness. With 1 minute and 8 seconds remaining, I would be challenged to do that in a nutshell here this morning. But happy to come sit down with you.

Mr. LOWENTHAL. But what I am saying, though, is that it is sometimes difficult, not because of the Army Corps, to measure some of these natural infrastructure cost-benefits, and I am just hoping that the Corps is working on better ways or more effective ways of measuring the impacts of natural infrastructure.

General SPELLMON. Yes, sir.

Mr. LOWENTHAL. And with that, I yield back.

Ms. MUCARSEL-POWELL. Thank you. I now recognize Congressman Mast from the great State of Florida for 5 minutes.

Mr. MAST. Thank you, Chairwoman.

General Spellmon, 9 of the last 11 years, in the name of flood control, water has been discharged out of Lake Okeechobee to Florida's east and west coasts. This isn't new news to anybody.

My question is simple, pointed, but important. Has the Army Corps of Engineers transferred toxic water—toxic water—from Lake Okeechobee to the east through the C–44 Reservoir into the St. Lucie Estuary and the Indian River Lagoon, and to the west through the Caloosahatchee River?

General SPELLMON. Yes, sir. We have conveyed water out of the system that has contained cyanobacteria and harmful algae blooms. Yes, sir.

Mr. MAST. And the Corps considers that toxic?

General SPELLMON. Yes, sir.

Mr. MAST. Thank you. I appreciate that acknowledgment. It is important so that we can move forward as we try to accurately

weigh the risks and assess what is going on as we try to manage both flood control for those to the south of the Herbert Hoover dike, and human health and human safety impacts to those to the east and west of Florida's Lake Okeechobee, as we are going summer after summer trying to work through these long-term infrastructure projects that you have been working on and your predecessors have been working on. So I appreciate that acknowledgment.

I do want to submit for the record the considerations by both the Centers for Disease Control, the Florida Department of Environmental Protection and the EPA, if you will take this by unanimous——

Ms. MUCARSEL-POWELL. No objection.

Mr. MAST. Thank you.

[The information is on pages 122–128.]

Mr. MAST. The CDC also notes that microcystins are a potent liver toxin produced by some species of cyanobacteria. The Florida Department of Environmental Protection says the mere presence of cyanobacteria blooms warrants the State to issue a warning. The EPA has reported cyanobacteria and their toxins are considered a serious threat to human health, and on May 22, the EPA declared that cyanotoxins above eight parts per billion posed too great of a risk for human contact, and so I appreciate you taking that for the record.

I would like to move to simply a thank you, General Spellmon. I have in front of me a letter from you to the State of Florida in which you outline, "In order to reduce future risk to the public, the Jacksonville district will lower Lake Okeechobee levels as much as possible within the operational band of the Lake Okeechobee regulations schedule prior to the start of the hurricane season 2019."

And I am giving you the most sincere—I hope you take this as the most sincere thank you that can be given from each of my constituents and from myself. You are making a real difference in our community with this operational and managerial change. For businesses, for people's health, for people's recreation, you are making a difference. It is not going unnoticed and we want to thank you for that.

And in that, I yield back.

Ms. MUCARSEL-POWELL. Thank you. I now recognize Congressman Rouda for 5 minutes.

Mr. ROUDA. Thank you, Madam Chair, and thank you, General Spellmon and Secretary James, for joining us here today. Harley Rouda from Orange County, California. My district is the 48th Congressional District of California. It represents about 80 percent of the coastline of Orange County, and there are a couple of key projects there. One of the key ones is the Santa Ana River project, and the Santa Ana River project was once characterized by the Army Corps of Engineers as, quote, "the worst flood threat west of the Mississippi."

This river is located entirely in southern California, the largest river in the area, and it meets the Pacific Ocean between Huntington Beach and Newport Beach.

With sea levels projected to continue rising and the increasing intensity of storms and natural disasters, the planned lower river channel modification for flood control along the 30 miles of the

Santa Ana River from Prado Dam to the Pacific Ocean is of critical importance to our constituents.

We have, as I mentioned, two major projects that we are interested in, the Santa Ana River mainstream project and the Westminster and East Garden Grove project, which rely on section 1043 authorization. It is estimated that these projects would prevent $40 billion in damages, protect over 100,000 acres from flooding, and benefit over 3.5 million people within Orange, Riverside and San Bernardino Counties during a design storm event.

General Spellmon and Mr. Secretary, would you both agree that the Santa Ana mainstream project and the Westminster and East Garden Grove projects are critical to maintaining flood safety in Orange County?

Mr. JAMES. Taking from what you say, sir, yes. I haven't actually visited that area yet. It is on the list, just haven't been there yet. But I think General Spellmon may have been there.

General SPELLMON. Yes, sir. Sir, I visited both of these projects from top to bottom and I agree, they are very important floor risk management projects.

Mr. ROUDA. And can you help? Can we kind of go back to a little bit of your testimony a little bit earlier, Secretary? It was about—and, General, please jump in as well. I am just trying to get a better handle of the authorizations—the projects have been authorized—and how well funded, what the gap is between funding and the projects. Because I believe I read somewhere that based on the President's budget, we are looking at a 100-year timeframe to address the currently authorized projects. Of course that doesn't include any new projects coming on board over that 100 years. So can you give us a little bit more information as to what the delta, what the plug is between what has been authorized and what is actually needed to meet our infrastructure needs in these areas?

General SPELLMON. Yes, sir. So the 100-year timeline that you have read about, it looks at the—roughly the $98 billion backlog of projects where we have a Chief's Report on the table but the project has not received funding yet. So that is how we have defined the backlog.

With the generous appropriations from Congress of recent years, $6.9, $6.8, almost $7 billion, about $1 billion of that is dedicated to actual construction. So that is the math. One billion dollars a year in construction against a $100 billion backlog.

Mr. ROUDA. OK, thank you. And help me understand, too, when you do the analytics on any of these projects, are you taking into account the impact of climate change and the need for addressing it both in terms of today as well as terms and forecast for future years?

General SPELLMON. Yes, sir, we do. So the recommendations that we take first to General Semonite and then to Secretary James look at a variety of criteria. As I mentioned earlier, life and public safety always—those projects generally rise to the top of our recommendation. Then we have across the country a number of legal mandates and requirements by court order that we have to fulfill. We have to pursue those projects. Some projects have a national security component to them. Generally you see a very high priority.

And then we get into things like BCRs, economic and environmental returns.

And then finally, sir, I would just say what is always high on our list, we want to finish what we start. If Congress has appropriated dollars to begin a project, we want to see it through to completion.

Mr. ROUDA. And one last question. Does that mean you believe climate change is real and impacting our infrastructure needs? And that question is to both of you.

Mr. JAMES. I am a civil engineer, I am not a scientist and I am not a weather forecaster. But I will tell you that we are making every effort, as far as I am concerned and as far as I know, to build sustainable infrastructure. Now, that means looking at—today, Mr. Graves over there, Garret Graves, mentioned that himself that we can't look back to the 1930s, and we are not doing that. And the technology is so much better today. We are working with NOAA to try to get rain forecasts accurate up to 24 hours, within 24 hours. We are not there yet, but we are working on that, things like that.

Now, that is my perspective on your question.

General SPELLMON. Yes, sir, briefly. So with regard to climate, I always encourage people to read the National Climate Assessment. You don't have to read the whole thing, but there are portions in there that talk about some of the significant changes in precipitation patterns that we are seeing, particularly in the Midwest, the quantity of events and the volume of rainfall that is falling.

Mr. ROUDA. Thank you, Madam Chair.

Mrs. NAPOLITANO. Thank you, Mr. Rouda.

Mr. LaMalfa, you are next.

Mr. LAMALFA. Thank you, Madam Chair. I appreciate the panel being here today. I just wanted to point out a couple issues in my area as well as my colleague in the adjacent district here on Yuba River, Feather River. My understanding is General Semonite has finalized the Chief's Report on the Lower Yuba River ecosystem restoration project there, so we are looking forward to that, working with the Yuba County Water Agency. They do a lot of great work, and so looking forward to the completion of this study on getting that ecosystem restoration going, which will be helpful for a lot of good reasons.

So, moving on to the Sutter Basin Feather River west levee project, again, these issues start to—they run through both districts, myself and Mr. Garamendi, as these projects go along and we want to see the completion of that on the south half.

And so we are glad that, Secretary James, you have been a great supporter of this project—appreciate that a lot—and as well as working with the Sutter Butte Flood Control Agency, which has really been emblematic of what a local agency, when allowed to take over a project that the Corps has overseen—we have gotten some great results and, indeed, moved up the timeline on the completion of that in Butte and Sutter Counties. What could have been 2024, it has saved $300 million and could have been done as soon as 2017 to 2019, and we should see that project completed in 2020. So that will be great for the flood control and the public safety of that area.

So we will still be ahead of time and much, much under budget. So I hope this can be an example we can work on and use in many more projects around the country.

What lessons, Secretary James, do you think we have learned from Sutter Butte and the section 1043 agreements the Army Corps has made on this? And then what do you think as far as cost savings and timelines going forward on—like we have done on this on future projects? What do you see as—how big of a thing is this for your administration on that?

Mr. JAMES. Well, my thinking on it is that we can save time and we can save money if the project sponsor can afford it. That is not every area in this country that can, but the ones that can and have the expertise. There are areas in this country that need flood control, for example, that there is not a bulldozer or a track hoe operator and equipment in their area, even if they had money.

So that is what I say. The availability of these authorizations, like 1043, are going to be very helpful in a lot of areas of this country, but they won't fit everybody.

Mr. LAMALFA. In a hearing we had here about a year, maybe 1½ years ago, it was something that some of you, you and your colleagues, had brought up as a model to have a lot more of that under this administration. And so are you seeing that that actually is playing out as a model for other areas? Is that being put in place in any widespread——

Mr. JAMES. You mean Sutter or do we have——

Mr. LAMALFA. Well, Sutter, we are almost there, right?

Mr. JAMES. Yes.

Mr. LAMALFA. But in other examples around the country was what the administration was——

Mr. JAMES. We have only had two, the McCook Reservoir in Chicago and Harris County in Texas. Both sponsors of those projects have engaged 1043 and seem to be very happy with what is happening with them.

Mr. LAMALFA. Good.

Mr. JAMES. I have heard no complaints about it.

Mr. LAMALFA. Do you believe, either one of you, that the Corps would have any issue with exempting certain States from NEPA when they have their own already high environmental standards, such as in California, CEQA, which a lot of times, you know, outdoes what NEPA requirements are?

Mr. JAMES. Congressman, you just threw me a curve ball. I hadn't thought about that.

Mr. LAMALFA. OK.

Mr. JAMES. But I would be happy to talk to you about that.

Mr. LAMALFA. Yes. We have seen other examples in different agencies, different issues, where they would be willing to let, you know, another transportation project since CEQA is at least equal or even more restrictive, more——

Mr. JAMES. Well, most of what——

Mr. LAMALFA [continuing]. Than NEPA. So——

Mr. JAMES. Most of what the Corps does, as I understand it, is regulated and driven by the law that the Congress passes. And even if the Corps sat here and told you they would be happy to give up NEPA in X State and——

Mr. LAMALFA. And provide for more one-stop shopping, you know, where you have two different entities, right.

Mr. JAMES. Yes, but that may not be their decision to make.

Mr. LAMALFA. Yes.

Mr. JAMES. The Congress may have already made that decision for them is what I am saying.

Mr. LAMALFA. But the Corps would be willing to go along with that conversation, you believe, you know? I guess we can send you more laws, but——

Mr. JAMES. I would be. I would be.

Mr. LAMALFA. Yes?

Mr. JAMES. Yes, I would be.

Mr. LAMALFA. OK. Because it is all about improving the delivery of projects in cost and time, and no need for duplicate effort. Yes. OK.

Mr. JAMES. It is worth exploring. Yes, sir.

Mr. LAMALFA. Yes, sir. All right. I know my time is already up. Thank you, Madam Speaker. I yield back.

Mrs. NAPOLITANO. Thank you, Mr. LaMalfa.

Mr. STANTON. Chairwoman?

Mrs. NAPOLITANO. Mr. Stanton, you are next.

Mr. STANTON. Thank you very much, Madam Chair, for holding this hearing. Thank you to the outstanding witnesses. I am a former mayor of Phoenix and I have seen the great work that the Corps of Engineers has done in my city over many years. I recently introduced legislation to create an environmental assistance program modeled after other Western States in partnership with the Corps of Engineers.

Can either of the witnesses—can you describe the benefits of a Corps environmental infrastructure assistance program, especially the benefits of improving existing water and wastewater infrastructure projects, before performance and reliability are compromised? Please, Major General.

General SPELLMON. Yes, sir. I mean, I think this year we are seeing that firsthand with the damages to the levees I mentioned just south of Omaha in between Kansas City. Just to do the initial repairs, not to restore the levee, but just to do the initial repairs, these are $7, $8, $9 million projects just to stop the water from flowing into the farmland.

Mr. STANTON. There are several projects the Corps is involved in along the Salt and Gila River corridors through Phoenix. Two of our late great representatives of Arizona, Senator McCain and Congressman Pastor, were both champions of restoration and development of the Salt River through Phoenix and the entire Valley of the Sun. We now call that project, that legacy project, Rio Reimagined. It pulls together multiple local governments, Tribal authorities, Arizona State University, the Corps and others to revitalize over 50 miles of important river corridor through the Phoenix region.

Currently, the Corps has only one Civil Works project manager assigned to the Phoenix office of the L.A. district, which represents all of Arizona. In my opinion, that is clearly not enough. How does the Corps plan to address staffing needs so that all Corps projects

in the State can move forward in a timely and appropriate manner with appropriate staffing levels?

General SPELLMON. Yes, sir. We will go back and look at this particular project office. As a general statement, we put people where the work is. On this particular set of projects, my understanding is that the current suite of projects were upland restoration, not necessarily down on the river where we can apply our aquatic ecosystem restoration authorities. I also understand that we would have to do an additional study of what other AER-type projects would be out there. But, sir, the workforce would follow the workload.

Mr. STANTON. Tres Rios is in a Corps project associated with Rio Reimagined. It is a project that is partially complete but we need the Corps to complete a limited reevaluation report, LRR, to raise the section 902 limit and request additional appropriations to fund it. What is the status of this report and when does the Corps expect it to be completed?

General SPELLMON. Yes, sir. So we require a New Start decision, a New Start authority, from Congress before we can initiate that general reevaluation report.

Mr. STANTON. Another important project in Arizona is the completion of the Lower Santa Cruz flood control project in Pinal County, the fastest growing county in the United States. Traditional farming communities like Maricopa, which was incorporated in 2003 with a population of approximately 1,000 residents, is now over 50,000 residents. This growing city sits in the middle of a flood plain. Currently, the draft Chief's Report is slated to be completed in July 2020 and finalized in 2021. In order to keep this project on an optimal schedule, our aim is to get this project authorized in the 2020 WRDA. Can the Corps accelerate the Chief's Report to coincide with the WRDA 2020 in order to keep the project on schedule?

General SPELLMON. Sir, we want to expedite this study and all the remaining studies to make them eligible for WRDA 2020. This particular project, we have some additional consultation we need to do with some Tribal members in the area, and then we will work to expedite the completion of this study.

Mr. STANTON. I appreciate that. It is not my district but it is important to the State of Arizona, and so it is important to my district as well.

Let me turn to the Rio de Flag flood control project in Flagstaff. Also not my district but important to the State of Arizona. Lieutenant General Semonite visited Flagstaff and toured the project in October. After his visit, he stated that its completion would be one of his top priorities before the end of his term as Chief. It is my understanding that the Los Angeles district has requested the remaining $52 million needed to complete this project.

A catastrophic flood will affect more than half of Flagstaff's 75,000 residents, including major parts of its downtown and Northern Arizona University, and could cause $1 billion or more in damages. Completion of this project is a top priority for the city. Will you support the district's funding request to complete this important project in the fiscal year 2020 workplan?

General SPELLMON. Yes, sir. So this will go forward with our recommendation. We will finish PED. We have the dollars to finish PED this year, and as you had the commitment from General Semonite, we want to finish projects that we start.

Mr. STANTON. I really appreciate that. I am just about out of time, so I will yield back but I have another question about Rio Salado Oeste, another very important project to Phoenix. I will submit it in writing for the record. Thank you.

Mrs. NAPOLITANO. Thank you, sir.

Mr. Palmer, you are next.

Mr. PALMER. Thank you, Madam Chairman. Secretary James, at a hearing in the Oversight Committee last year, I requested a list of outstanding feasibility studies by the Corps, and after waiting nearly 9 months I received a list of 97 studies. And the thing that concerns me about this is that 36 of those studies are over 5 years long and still ongoing, as far as I can tell; 22 are over 10 years long; 15 are over 16 years long; and 4 of them are 20 years older. And there are others that for some reason—Morganza down in Louisiana has been being studied since 1992 and apparently spent about $75 million on it.

There are a couple of other studies, questions that I raised in that hearing last year—West Shore, which has been studied over 40 years, it is not on the list because it is now under construction; and the Comite River, there was—since 1983 they have been studying and building a diversion canal from the Comite River over to the Lilly Bayou for flood mitigation in the event of a 100-year, 500-year flood, and it is now under construction, but only after they had a catastrophic flood event.

Under WRRDA 2014, in an attempt to reduce the time and cost of these studies, there were limits put on the Corps of 3 years and $3 million. These 5-year and older studies, 36 of them, run over $140 million. Are you aware of that?

Mr. JAMES. I wasn't aware of the number or the amount of money. I am aware of the fact that the Corps—that they are introducing studies as 3 x 3 x 3, are coming to me for waivers more often than I feel we should be doing that. If it is a 3 x 3 x 3, good. If it is not, don't call it that upfront.

Mr. PALMER. Well, the law requires that it is 3 years and $3 million.

Mr. JAMES. Sorry?

Mr. PALMER. The WRRDA that was passed in 2014 requires 3 years, $3 million. Now, you, in response to a question—and by the way, Madam Chairman, 17 of these long-term studies are in California and 23 of them are in New York and New Jersey, 8 of which are related to Sandy.

But you responded earlier to a gentleman who asked you a question and you said that you are a civil engineer. I worked for two international engineering companies prior to running a think-tank, and you and I both know that if we run an engineering company and we went out for a bid on a project and had these kind of results in terms of coming up with a design for a plant or a water system for that matter, we would be out of business.

Would you like to respond to that as an engineer?

Mr. JAMES. I didn't say I like it.

Mr. PALMER. But I want to know what you are going to do about it.

Mr. JAMES. That is what I work at every day, sir. That is what takes up my time. That is what keeps me up at night. I came here with the understanding and desire to help the Corps change themselves through their processes. If they get the money, they get it done. And I am still working on that. As long as I stay here, I will continue to work on that.

Mr. PALMER. Do not take this as an attack against you, sir. I appreciate what you are trying to do and I appreciate the fact that you are an engineer, because I know you are very linear in your thinking and very analytical. But we are facing some serious situations around the country right now. We heard Representative Bost talk about this. We have heard the chairwoman talk about it. And I think some of the issues that we are dealing with, it is because the Corps is still studying the problem and not doing the project, and that is what happened in Louisiana.

It is going to happen in some other places if the Corps keeps studying and doesn't start building. And I am not attacking the Corps either. I am just saying there are issues out there that we need to address, and instead of someone making a career out of a project study, it might be better if we start turning some dirt.

Mr. JAMES. Well, I can read you my opening statement and just exactly what you said is in it, and that is how I feel about this. I came here—I didn't come here for any other reason.

Mr. PALMER. Well, I appreciate that.

Mr. JAMES. But this is what I am trying to do, sir. And I will offer this: any ideas or even invite me over to your office just to discuss this, I will be happy to.

Mr. PALMER. Well, I would be happy to go over the list of projects with you and I think the Members from California and some of these other places that are in harm's way might have some interesting——

Mr. JAMES. I would be more interested in your thoughts about the solution rather than seeing the list that hasn't been done right. I would be happy to discuss that.

Mr. PALMER. I would be happy to meet with you about it.

Madam Chairman, I yield back.

Mrs. NAPOLITANO. Thank you, Mr. Palmer.

Mr. Espaillat, you are recognized.

Mr. ESPAILLAT. Thank you, Madam Chair. I thank the witnesses for their testimony. This is an important opportunity to talk about the need to invest in water infrastructure, particularly habitat restoration and disaster resiliency. I represent half of Manhattan, surrounded by water, the Hudson River and the Harlem River, and I want to take a few moments to draw your attention to some sites that are incredibly important not only to my district but I would say New York City as a whole as well as the greater metropolitan area.

Over the past decades, various work has been done under numerous programs to help clean up the Hudson River, restore habitat and improve public access to it. The Hudson River now has become a playground for sports, recreation, families and tourists as well.

In an urban area as dense as New York City, it is critically important that residents have opportunities to interact with their natural surroundings. Over the past decades, the Army Corps of Engineers has been conducting various studies within the harbor and the broader Hudson-Raritan Estuary. Many of these include ecosystem restoration and fish life buildup as well as resiliency.

The Corps is finishing up its recommendations, which would include nearly two dozen projects throughout the region, and I understand the Corps plans to include these projects in the next Chief's Report. It is my hope that we are able to get this project authorized in the next Water Resources Development Act.

Furthermore, I want to highlight the importance of the ongoing New York City-New Jersey Harbor and coastal storm risk management facilities study. Aside from protecting the overall area and harbor from storm surge, the study also looks at smaller projects to protect individual communities that will be impacted by storm surge.

During Superstorm Sandy, East Harlem was the most significantly impacted portion of my district, experiencing severe flooding. The bulkhead that protects this neighborhood from further flooding is severely damaged and needs to be immediately repaired. Furthermore, current city comptroller and former Manhattan Borough president Scott Stringer put together an ambitious proposal to extend the life of the Harlem River shoreline through a number of structural changes and ecosystem development which will enhance resiliency.

I want to also raise two other marsh restoration projects in my district, one of which also includes the initial Hudson-Raritan Estuary studies. The first is the Inwood Marsh, which is just two blocks away from where I live, located in the northern tip of Manhattan; and the other one is Swindler Cove, just off the Harlem River in northern Manhattan. I believe it is within the Corps' ability to do this under your continuing authorities, and we want you to recommend them for immediate action.

I would like to ask if you can look into these projects under your continuing authorities programs, as I believe they will make for restoration of considerable green spaces and waterfront access in a part of my district that could use all the green space it can get.

I want to ask, Mr. James or Mr. Spellmon, can you look into these items as part of your coastal storm risk management studies, the first ones that I mentioned, regarding East Harlem and both the New York and New Jersey initiative? Is there anything that you are doing now that you could look at regarding making our waterfront in Manhattan stronger and more resilient in preparation for the next storm?

And the second question, of course, is can you work on these two smaller projects in the northern tip of Manhattan?

Mr. JAMES. No, sir, the answer to both of those are yes. I don't know what kind of engagement there has been with the district on any of those three projects, but regardless if there has been engagement or not, I think General Spellmon can take care of making engagement. He may know if there has been.

Mr. ESPAILLAT. Well, I look forward to working with you, General Spellmon, and these are very important projects for the north-

ern tip of Manhattan, East Harlem, New York City and the tristate area.

Thank you so much. I yield back, Madam Chair.

Mrs. NAPOLITANO. Thank you, Mr. Espaillat.

I now recognize Mr. Westerman to introduce the next Members for questions.

Mr. WESTERMAN [presiding]. Thank you, Madam Chair. At this time I would like to recognize the gentleman from North Carolina, Mr. Rouzer, for 5 minutes.

Mr. ROUZER. Thank you. I appreciate the opportunity, Madam Chairman, for this hearing, and I want to thank our two witnesses for being here. Before I forget, I would like to ask unanimous consent to insert in the record a validation study for Wrightsville Beach, North Carolina, dated June 2019, and a beach renourishment evaluation report for Carolina Beach, North Carolina, dated June 2019. If no objection, I would like to insert these for the record.

Mr. WESTERMAN. Without objection.

Mr. ROUZER. Thank you, Madam Chairman.

Mrs. NAPOLITANO. Mr. Chair, without objection.

Mr. ROUZER. Mr. Secretary—I am sorry?

Thank you, Madam Chairman.

[The information is on pages 128–129.]

Mr. ROUZER. Mr. Secretary and General Spellmon, Wrightsville Beach, Carolina Beach, real briefly, both have really, really good cost-benefit ratios. We need to have the Carolina Beach project included in the Chief's Report for WRDA 2020. From our standpoint, it looks like that is on time and looking good. From your standpoint, I am curious what you think.

General SPELLMON. Sir, as you know, both those draft reports are out for public review. We will collect up those comments by the end of this month and then we will wrap up those reports and have them submitted to the administration.

Mr. ROUZER. And then, of course, Wrightsville Beach needs to be included in the Director's Report for WRDA 2020, just to keep everything on par, on time. I think you were including that particular project in your previous answer, but just want to confirm.

General SPELLMON. Yes, sir. Yes, sir, I was.

Mr. ROUZER. North Topsail, Surf City—Secretary James, you and I spoke about this some time ago. We had a great conversation, and I know you all were looking at including it in the workplan last time around. It didn't make it for whatever reason, but I want to stress this is a critical New Start included, authorized by Congress, and quite frankly had that been in place prior to Hurricane Florence, we wouldn't have had near the amount of damage there at North Topsail Beach that we had as a result of Florence coming through. So I just want to highlight that. Any comment either one of you might have on that particular project?

General SPELLMON. Yes, sir. So this is certainly also eligible for the FY19 supplemental funds. We owe the Secretary our recommendations on both projects and investigations by the end of this—by the end of this month, and we are going through that process now.

Mr. ROUZER. I thank you. And then the last item I want to touch on—and I will be very candid with you, I am quite frustrated. In fact, frustrated may not be the word. I have been right mad. In fact, it has almost led a Southern Baptist to cuss. And that is the Southport no-wake zone, which was authorized in 2016. It has taken 3 years, still no answer, and my inclination, my instinct is the Corps doesn't want to do it.

This is not a divisive issue back home. It is unanimous—the sheriff's department, the county commissioners, the town of Southport, everybody. In fact, last week when I was back home for July the 4th, you know, folks want to talk politics, and the number one item that was brought up to me was what in the world is going on with our proposed wake zone here at Southport?

How do I answer that? Where are we?

Mr. JAMES. Tell them the letter is on my desk, to you.

Mr. ROUZER. Well, is that a good letter or a bad letter?

Mr. JAMES. I think you will quit cussing.

[Laughter.]

Mr. ROUZER. Well, I can tell you what, if it is a bad letter you are going to hear about it. This has been a very, very frustrating thing, and I have said this to you privately and I will say it publicly. Where is the common sense and where is the common courtesy? This should not be complicated. It should not be complicated. I don't usually get riled up about stuff. I am a pretty even-tempered fellow. But like I said, this one has pushed me to the limits because it is just nonsensible. It needs to get done. We want this. As my colleague, Mr. Graves, said earlier in the hearing, we need you to work to get to a yes, not work to get to a no.

Mr. JAMES. Unfortunately, it was not on my desk for 3 years, sir. It has been on my desk a very short period of time and it will be coming to you with a yes right away.

Mr. ROUZER. Thank you, sir. That is all I need to know.

I yield back.

Mr. WESTERMAN. The gentleman yields back and the Chair now recognizes Mrs. Fletcher for 5 minutes.

Mrs. FLETCHER. Thank you. I would like to thank Ranking Member Westerman and Chairwoman Napolitano for holding this important hearing, and I want to thank the witnesses for taking the time to testify this morning.

The Army Corps of Engineers has one of the most critically important jobs in the country. Nowhere is that more true than in my district, in Texas' Seventh Congressional District, where the Army Corps' investment in the Addicks and Barker Reservoirs back in the 1940s has been one of the most critical pieces to the development of the city of Houston and to our protection when it comes to flooding and protecting our infrastructure.

So we certainly appreciate the work that the Galveston district has done in particular, and we know that while the Corps often suffers from inadequate budgets when compared to the number of authorized projects, it also seems to us that the process can be slow-moving even when fully supported by Congress. And so I want to talk a little bit about that and the concerns that my constituents have for some of the projects.

Secretary James, I understand you have placed a focus on pushing the Corps to operate more efficiently and, as I have heard you say, to move dirt faster. That is certainly something that we are interested in seeing. And I know that the Houston Ship Channel is expecting a Chief's Report soon.

Given the tremendous economic boom that we have seen in the Houston economy and the petrochemical industry as well as the increasing size of the ships coming through our port, will you agree with me that this is one project where we need to get moving dirt as soon as possible?

Mr. JAMES. Yes, ma'am. I have been to the area. I have seen the industry, the commerce there, the need for more infrastructure, better infrastructure, and I do agree with you 100 percent.

Mrs. FLETCHER. Thank you. How can we move faster than the usual route that could take that project to 2030 or beyond? How can we start by dredging by 2021?

Mr. JAMES. Let General Spellmon talk to that. I think he might be more up to date on the schedule. And then I will address anything after that.

Mrs. FLETCHER. Thank you.

General SPELLMON. Congress is helping, as is the administration, in helping us move projects from start to finish much more rapidly, and I will say that by we are funding projects to completion. So the example I like to use here is the Herbert Hoover dike in Florida. With incremental funding, it took us 13½ years to get that project to the halfway point. This is a cutoff wall for about 54 miles of dike—13½ years to get to the halfway point. Congress and the administration made the decision to fully fund the remainder of that project. It is only going to take us 3 years to get the last 50 percent. So that is one way that Congress and the administration is helping us complete projects faster, and you can apply that same dynamic to projects like the Houston Ship Channel.

Mrs. FLETCHER. Thank you. And can you tell me—I believe the Chief's Report is expected. What can you commit to doing to ensure that the Chief's Report is done on time?

General SPELLMON. So on this particular study, ma'am, I understand it is a non-Federal sponsor now that wants to take a pause on this particular Chief's Report as they want to pursue a locally preferred plan to look at two-way traffic for the entirety of the ship channel. I am sorry, I don't have those dates in front of me, but I can certainly follow up with you on the details I have from General Owen.

Mrs. FLETCHER. Thank you, I would appreciate that. That issue is of great concern to our constituents and to folks throughout the entire Houston region. And I think the other thing that is a challenge, and I hear it from my constituents at townhall meetings and other things: we do have several fully authorized and funded projects ready to go, but obviously engineering is involved and we want to make the best possible decisions and we want to be thorough in the analysis. And I am grateful to the Galveston district in particular. I spent time just last week with Colonel Vail and several members of the staff and am very impressed with the work they are doing.

But what can we do to move projects faster when there is a clear benefit? In addition to fully funding, what else can we do to just get these projects moving faster?

Mr. JAMES. I would say the first thing you do is stay fully engaged with whatever district that you are dealing with, because sometimes that engagement slips. We are all busy. Most of the people that you are talking about being sponsors are businessmen; they have plenty to do anyway. But staying engaged is one thing.

The other thing is if there is rights of way or relocations of railroads or lines or whatever, that is important, is that the sponsors engage those other entities that can really, really hold up projects. I mean, that can be a big holdup.

And then other than that, go and engage the appropriators and get the money. That is my guess.

Mrs. FLETCHER. OK. And I see I have gone over my time. I appreciate it. Thank you very much. I yield back.

Mr. WESTERMAN. The gentlelady yields back and the Chair now recognizes Representative Babin for 5 minutes.

Dr. BABIN. Thank you, Mr. Chairman, and I appreciate that very much.

Thank you, both of you witnesses, for being here. And also, thank you, Chair Napolitano and Ranking Member Westerman, for convening this very important hearing on our Nation's water resources.

I would also like to thank our distinguished witnesses again for being here. And I would be remiss if I did not thank you again for your leadership during and after Hurricane Harvey to ensure my constituents in Texas' 36th Congressional District and the great people in the Greater Houston and coastal Texas region are adequately protected from catastrophic natural disasters. Unfortunately, the North American rainfall record is in my district.

My congressional district is home to three highly important Civil Works projects of great economic benefit to our Nation—a project to deepen and widen the Houston Ship Channel currently undergoing a review by the U.S. Army Corps of Engineers; also a federally funded project to deepen and widen the Cedar Bayou Navigation Channel; and a federally funded project to deepen and widen the Sabine-Neches Waterway, all of these in my district.

I would like to talk to you, ask you Secretary James, first: In regards to the Houston Ship Channel, the draft National Economic Development, or NED plan, recommends improvements and widening for only a portion of the Houston Ship Channel through Galveston Bay, Redfish Island, if you are familiar with it.

Houston pilots and private industry have indicated that a partial widening, as proposed, will create a bottleneck that compromises safety and efficiency throughout the entire system. What can Congress do—more importantly, what can I do—to help you ensure the Chief's Report reflects the necessary options and opportunities to address, safely, the deepening and widening of the entire Houston Ship Channel, not just part of it, including the long-term maintenance of the locally preferred plan?

Mr. JAMES. Sir, I have visited with the local people that are engaging in trying to get that done in Houston. Frankly, I agree with

them. It does not make much sense to me to dredge and widen half of a channel and leave the other half not.

And furthermore, it does not make sense to me that if we are only going to dredge half of it, why we are dredging the outer half rather than from the port out.

Dr. BABIN. Right.

Mr. JAMES. I would be happy to talk to you about this further. I have got thoughts about it. And your people have visited me more than once, and I would really like for us to sit down and talk about this. I do not think the Corps has any anti-ship channel thoughts whatsoever. I think it is just the way their economics worked out. But I think it ought to be looked at.

Dr. BABIN. OK. Well, I am very, very happy to hear you say that because we really do need to have a dialogue because it just does not make a bit of sense.

Mr. JAMES. Yes, sir. Yes, sir. Well, if you will let us know.

Dr. BABIN. Yes, sir. And then would it also be beneficial for the Corps to use economics updated from 2016 and 2017 to reflect the Federal interest in long-term maintenance? Don't you agree with that?

Mr. JAMES. Yes, sir. I certainly do. I do, as fast as things are changing, particularly down there. I do.

Dr. BABIN. Thank you. And then General Spellmon, section 902 is a policy that limits the construction cost to 120 percent of the congressionally authorized total project cost. However, there have been several examples since award of 2007, where Civil Works projects that were federally funded and under construction either busted the 902 limit or were so close to the limit that construction was expected to stop unless Congress authorized an increase to the total project cost.

A great example is the Savannah Harbor deepening project, which required an increase in its total project in award of 2018. It is my understanding that the Post-Authorization Change Report basically, on an economic update, took only 3 months to complete under a process that normally takes 12 to 14 months.

And as we see more and more port and waterway deepening and widening projects being federally funded for construction, would you commit to expediting any future post-authorization economic updates to 3 months to avoid any delays in their completion, sir?

General SPELLMON. Sir, every Post-Authorization Change Report is different. You have my commitment that we will expedite all of these as it becomes necessary.

Dr. BABIN. Yes, sir. Thank you so much.

And then Mr. Secretary, would you commit to expediting these reviews as well?

Mr. JAMES. Yes, sir. I am trying.

Dr. BABIN. All right. Well, I will yield back. That is a good affirmative answer there. Thank you so much.

Mr. WESTERMAN. The gentleman yields back, and the Chair now recognizes Representative Carbajal for 5 minutes.

Mr. CARBAJAL. Thank you.

Secretary James and General Spellmon, thank you for being here today as we hold our first hearing on the implementation of the Water Resources Development Act, also known as WRDA.

I also want to take this opportunity to thank you and the Los Angeles district for the incredible work and support the Army Corps provided to reopening the 101 Highway following the tragic Montecito debris flow in my district. Thank you for the great work that you did.

As we move forward in developing the next WRDA legislation, I want to raise concern on how the benefit-cost ratio is calculated, also known as BCR. This was an issue also that was raised by my colleague, Representative Lowenthal, previously.

I have heard from stakeholders in my district about their frustration on how funding gets allocated. As you are probably aware, construction of the Lower Mission Creek project has been authorized since the year 2000 and was later amended in 2007 to reflect the cost share between the Federal and non-Federal partners.

Despite the project being shovel-ready and our local government having invested over $18 million in non-Federal resources, Federal resources have not been made available for this project. Currently, the BCR score does not account for the environmental benefits.

In your experience, what are some of the recommendations we can look to to move a project like this forward? And two, what are the benefits for accounting for environmental impacts in a BCR score?

Mr. JAMES. Sir, I would like to visit with you personally offline to discuss BCR, if that would suit you. Generally I do not think BCRs are being addressed properly, either. There are benefits out there that we are not capturing, particularly in less fortunate areas. We are not capturing those benefits to be able to offset the cost of doing projects, and therefore, you wind up like this, with a low BCR.

Now, I'm not talking about drumming up benefits or anything like that. I am talking about taking a real look at what we call benefits and how we rack those benefits against the cost-benefit ratio. But I would love to visit with you more.

Mr. CARBAJAL. Great. Well, I hope to someday get a letter like the one that is on your desk that is going to my colleague, Representative Rouzer, as was mentioned earlier, because this is a project that has been overstudied for over 30 years. Stakeholders are all on board. There is no dissent on this project. And what is at stake here is real, real flooding that could take life and property and pretty much with a huge amount of risk.

So I look forward to talking to you offline. And again, I look forward to really making some progress on this important issue. So thank you very much, Madam Chair. I yield back.

Mr. WESTERMAN. The gentleman yields back, and the Chair now recognizes Representative Mitchell for 5 minutes.

Mr. MITCHELL. Thank you very much, and I appreciate the committee allowing me to participate today.

Gentlemen, as you both know, I am from Michigan, the Great Lakes State. I am going to try and transport you to the Great Lakes. This time of year it is a great place to be and there is no ice, so good news. We only have 5 minutes so I want to pursue a couple of questions and hopefully get some brief answers and you can talk offline if needed.

Finally, the Soo locks are underway, the progress on that, after being authorized 31 years ago. I suggest to my colleague down the way that sometimes patience is a virtue. Hang in there.

It has been approved by the Army Corps after 31 years. It is underway in terms of the initial construction. As you all know, it is a vital link to commerce, and there were some national security concerns because of moving taconite and things through the Soo locks.

I get regular updates from the Detroit district, which I really appreciate. It is very helpful. Can you both update me what the next steps are and if we are on track in terms of the progress for having that become operational? Can you give us an update on that, please?

General SPELLMON. Yes, sir. A general statement: We are on track. So just a few updates.

The design of the upstream channel, sir, that is in progress. And we will award that construction contract before the end of this fiscal year.

The designs of the upstream approach walls and the new lock chamber, those are also in progress. We will award the upstream approach wall construction contract next fiscal year, and we have asked for $75.3 million in the President's budget request for fiscal year 2020 to advance those efforts. But we are where we need to be, sir.

Mr. MITCHELL. And be assured, I have had conversations with the White House and the administration about ensuring that that funding is part of their request. And we see the assurances, in fact, that it will continue to be on the top of their list to continue that construction. So if you hear anything otherwise, let me know so I can go—not curse, but maybe express my—so I think we are in good shape on that.

Is there anything else here in Congress you need from us to support that other than ensuring that appropriation continues at the levels you need to move forward?

General SPELLMON. No, sir. We are getting all the support that we need from a technical perspective to advance the construction in the right sequence.

Mr. MITCHELL. What is the target date in your mind for the additional lock to become operational?

General SPELLMON. Sir, I would like to follow up with you after that, after here.

Mr. MITCHELL. I suppose. OK. I am happy to schedule that if you can.

Let's move ourselves off to the world of Asian carp and the Brandon Road lock project, which is a critical issue for the Great Lakes region, for the basin. As you all know, that is the last stopping point for the spread of Asian carp into the Great Lakes Basin and the damage to the ecosystem that would do.

Your feasibility study was completed. Can you highlight some of the findings that were in the Chief's Report and where we plan on moving forward?

General SPELLMON. Yes, sir. So General Semonite did sign the Chief's Report, as you know, and that is now with the Secretary for the administration's review. Sir, we understand the concerns

that we are hearing from the field on the cost. And there are really two drivers for that.

First, we have a high contingency—because we are dealing with some new technology on these fish barriers. And we are confident that we could drive that contingency down as we get into preliminary engineering and design. That was the first driver.

The second driver was the addition of the concrete channel from the previous report. And we believe that concrete channel is important for this particular project because that is what is going to provide the best efficacy for these new technologies on this particular barrier.

Mr. MITCHELL. I have heard some concerns about the non-Federal partner and, frankly, their ability to participate as we need them in this. Where I suggested it is being pursued, so you know, is whether or not we look at a non-Federal partner to be the Great Lakes compact to look at approaching it in that manner because there has been some concern whether or not the State of Illinois will support the effort.

Do you guys have any opinion on that?

Mr. JAMES. I don't think I will give you an opinion on what you should do, sir. I can tell you that since before this even started in earnest, the State of Illinois, which almost has to be the sponsor because it is in that State, et cetera, et cetera, has I will not say waffled, but they really cannot make up their mind whether they want to engage as the sponsor or not.

For the term that they decided to engage as the sponsor, it looked pretty simple to me to have a meeting and all the States agree to how much they were going to kick in on it and all that. But I hear there is trouble again.

Mr. MITCHELL. Well, we are engaging on that issue, just so you know, because it is critically important.

If we could, one comment. I would like to schedule offline, because there is not enough time here to talk about fairly historic Great Lakes levels, the impact this is having in terms of flooding and some of the flood maps that you folks are talking about versus—so that is a longer conversation than 5 minutes will enable us.

But if we could schedule in my office, I would like to follow up on that because obviously we are seeing some historic flooding in the Great Lakes Basin.

Mr. JAMES. I think you have got a commitment from both of us to do that. But I don't know why—I think there are 32 or so on this committee. Over half would need to sit down and talk about the same thing, flooding.

[Laughter.]

Mr. MITCHELL. Well, it at least it applies so at least you have a full-time gig right now. So I appreciate your time and your collective commitment to serve. Thank you very much. I yield back.

Mr. WESTERMAN. The gentleman yields back. And I would like to personally thank the chairwoman for trusting me with meaningful work during the committee, and I yield back to the chairwoman.

Mrs. NAPOLITANO [presiding]. The Chair recognizes herself, and I would like to recognize Ms. E.B. Johnson.

Ms. JOHNSON OF TEXAS. Thank you very much. And let me express my appreciation to both of you for holding this hearing. And thanks to the witnesses for being present.

On this past Monday, I held a bipartisan regional roundtable discussion in my district to tackle the critical issue of flooding, flood prevention and flood control. We had Federal, State, regional, and local stakeholders who participated in a rather lively discussion.

And during the roundtable, it was explained how $100 billion in flood damage was prevented by spending $2 to $3 billion annually on a flood control system. And it was clear that issues of flooding, flood prevention, and flood control must be addressed regionally using cross-functional teams with stakeholders at all levels of Government and working together.

So my question—and let me precede that by saying that we have had great cooperation with the Corps in that area. I am from Dallas, Texas, not the coastal area of Houston. But how can the Corps develop national programs that focus on preventing flooding rather than just being reactive and responding to flooding? That is one question.

The second one is: How can the Corps share information on flooded areas with navigation technology providers to reroute drivers away from flooded roads and highways?

And the third one, and maybe both of you can address all three: Does the Corps have the authority it needs to address stormwater runoff, filtering stormwater, and recharge aquifers? I hope I did not overwhelm you with all three questions at one time.

Mr. JAMES. You almost did.

[Laughter.]

Mr. JAMES. No, ma'am. I will take the "prevent flooding" one. I agree with you 100 percent. One dollar of prevention is worth $10 of fixing. And I agree with you 100 percent. Now, the only thing that keeps us from doing that is the authorization and the appropriation of money, both in the President's budget and by the Congress.

And we realize, and our people, like yourself, out in these communities bring to us the reasons we need flood control here. We need it. OK? So we realize that the Corps goes back, looks at it, but then getting it from there to a product, it is hard, and it is getting harder all the time.

Now, when a storm hits and washes away everything you have got, then people are willing to jump in and help you then that were not willing to help you prevent that flooding. So that is where we are. And we take what money we can get as a Corps of Engineers and spread it as thin as we can, although I think General Spellmon mentioned just a few minutes ago, we are trying to complete projects with what money we get before starting another project.

Now, there is an argument there, whether we ought to be doing that or not. So I hope I did not confuse you.

Ms. JOHNSON OF TEXAS. No.

General SPELLMON. Ma'am, I would only add to what the Secretary said, but just, humbly, a little historical perspective. I mentioned in my opening statement that the Nation is experiencing its wettest year on record, at least east of the Mississippi and over 124 years.

And the Nation, Congress, and the administration have, over generations, invested in flood control because if this year's event happened 100 years ago, we have had those type of floods, and hundreds of people have died. I mean, there are mass graves in this country that buried the dead from flood events.

We had some deaths this year, but not in the hundreds, certainly not in the thousands. So now it is getting this infrastructure ready for the next generation, and all that we are seeing with changes in precipitation and sea level rise. And the Corps, we are committed to do our part within all of our authorities to advance this infrastructure to get it ready for the next generations that follow us.

Ms. JOHNSON OF TEXAS. Well, thank you very much. My time is about out. But what do we have to do to encourage a bit more focus on prevention? Does it mean legislative authority?

Mr. JAMES. On prevention of flooding? I think we have got a lot of authorities in general. But on particular projects, they have to go through the system. They have to have an authorization, and then they have to have the environmental work done on it. They have to get a Chief's Report, and finally, come back to the Congress for appropriations or be put into the President's budget. Yes, ma'am.

Ms. JOHNSON OF TEXAS. Thank you very much. My time is expired.

Mrs. NAPOLITANO. The gentlelady yields back.

Lots of Members wanted a second run at it, but we do not have enough time. And I thank you for your patience.

Some housekeeping questions. Mr. Secretary, Congress directed the Corps to solicit projects and study requests from local sponsors and issue a report to Congress through section 7001 of WRDA. As you know, the 2019 report was 5 months late.

Can you commit that the 2020 report, under development, will be delivered on time in February 2020 to be used to formulate WRDA 2020?

Mr. JAMES. Yes, ma'am. My fault. I will take care of it.

Mrs. NAPOLITANO. Thank you for your commitment. And you heard it.

Can you also provide to the subcommittee the following: A brief summary of a Chief's Report, eight of them, already submitted to Congress for authorization, and any known Post-Authorization Change Reports needing congressional action? You can provide it for the record.

Mr. JAMES. Yes, ma'am. You have our commitment we will have those ready in time for the next WRDA bill.

Mrs. NAPOLITANO. Thank you for your commitment. And thank you very much. It has been almost 2½ hours, and I thank you for your patience. And we are now concluding this portion of the meeting. Thank you, gentlemen.

Mr. JAMES. Thank you, Madam Chair.

Mrs. NAPOLITANO. Any additional comments and questions may be submitted for the record and they will go to you.

Now we will proceed to hear from the next panel.

[Pause]

Mrs. NAPOLITANO. Thank you for being here. All of you, welcome. Thank you for your patience. You heard there was quite a bit of interest in the Army Corps testimony.

For panel 2 we have Mr. Rob Innis, Sparrows Point, Maryland, plant manager, LafargeHolcim, on behalf of the Waterways Council. We have Mr. Chad Berginnis, executive director, Association of State Floodplain Managers. Then we have Mr. Tom Waters, chairman, Missouri Levee and Drainage District Association.

Then followed by Ms. Julie Hill-Gabriel, vice president for water conservation, the National Audubon Society. Then we have Mr. Derek Brockbank, executive director, American Shore and Beach Preservation Association. And finally, Dr. F. Martin Ralph, director of the Center for Western Weather and Water Extremes, Scripps Institution of Oceanography at UC San Diego. And without objection, your prepared statements will be entered into the record.

Mr. Innis, you may proceed.

TESTIMONY OF ROB INNIS, PLANT MANAGER, SPARROWS POINT, MARYLAND, LAFARGEHOLCIM, ON BEHALF OF WATERWAYS COUNCIL, INC.; CHAD BERGINNIS, C.F.M., EXECUTIVE DIRECTOR, ASSOCIATION OF STATE FLOODPLAIN MANAGERS, INC.; TOM WATERS, CHAIRMAN, MISSOURI LEVEE AND DRAINAGE DISTRICT ASSOCIATION; JULIE HILL-GABRIEL, VICE PRESIDENT FOR WATER CONSERVATION, NATIONAL AUDUBON SOCIETY; DEREK BROCKBANK, EXECUTIVE DIRECTOR, AMERICAN SHORE AND BEACH PRESERVATION ASSOCIATION; AND F. MARTIN RALPH, PH.D., DIRECTOR, CENTER FOR WESTERN WEATHER AND WATER EXTREMES, SCRIPPS INSTITUTION OF OCEANOGRAPHY, UNIVERSITY OF CALIFORNIA SAN DIEGO

Mr. INNIS. Thank you, Chairwoman Napolitano, Ranking Member Westerman, members of the subcommittee. Thank you for the opportunity to testify before you today. My testimony will focus on the importance of the inland waterway transportation system.

I currently serve as the plant manager at the Sparrows Point slag cement facility in Baltimore, Maryland, for LafargeHolcim. LafargeHolcim produces cement, aggregates, concrete, and specialty construction solution products used in building projects ranging from affordable housing to small local projects to the largest, most technically and architecturally challenging infrastructure projects.

We operate in more than 80 countries, with over 80,000 employees. We currently operate 30 facilities along the river system, and in 2018 moved 9.2 million tons by river. If we were to move this tonnage by truck, it would equate to 368,000 more trucks on the road.

I am also a board member of the Waterways Council and an executive committee member. WCI is a national public organization that advocates for the modern, well-maintained system of inland waterways and ports. Recently I also became chairman of the Inland Waterways Users Board.

When thinking of the transportation infrastructure, the inland waterways system is often overlooked. Our rivers are the fourth "R" of the critical multimodal system of roads, railway, and run-

ways. In 2017, more than 578 million tons valued at $220 billion were transported on the inland waterways system.

Of that tonnage, almost 80 million tons were aggregates, which is 14 percent of the total tonnage moved along the inland waterways system. Some aggregates and cement projects sourced from the river that benefits America included the new terminal complex at the Louis Armstrong Airport, the Amazon Distribution Center in Minneapolis, and the I–90 tollway rebuild from Chicago to Milwaukee.

After only passing two WRDA bills in 14 years, this committee, starting in the 113th Congress, made WRDA a priority, passing three bills in 6 years. I would like to thank the committee for implementing the changes in the WRRDA 2014 that have significantly accelerated the project delivery in the inland waterways system.

The cost-share change at Olmsted Lock and Dam allowed for the Inland Waterways Trust Fund to operate over the last 6 years at a 25-percent trust fund/75-percent general fund split. This cost-share change has also accelerated the operability of Olmsted, allowing for over $600 million in annual economic benefit to be accrued 4 years ahead of schedule.

Also enacted in 2014 and taking effect in 2014, the inland waterways industry supported a 45-percent tax increase to the diesel tax commercial operators pay that is deposited into the Inland Waterways Trust Fund. This is currently the highest Federal fuel tax being paid by any mode of transportation.

In WRDA 2016, Congress changed the cost-share model, refunding the deep draft ports with depths of 45 to 50 feet from 50 percent non-Federal sponsor and 50 percent Federal Government, to 25 percent non-Federal sponsor to 75 percent Federal Government in order to allow the ports to expeditiously expand capacity to become post-Panamax-vessel-ready. This is necessary to enable our ports to remain competitive on a global scale.

In WRDA 2007, this committee created the Navigation and Ecosystem Sustainability Program, NESP, as an innovate effort combining two of the Army Corps of Engineers–Civil Works key missions, navigation and ecosystem restoration. This program was studied for 13 years at a cost of $74 million.

Upon completion of the feasibility study, the Corps of Engineers moved directly to Preconstruction Engineering and Design, PED, for 7 years, spending $62 million before being abruptly halted. It is discouraging that a project that has already seen $136 million and 21 years of time invested was halted. Waterways users, including my company, would like to see the Corps immediately restart PED. We foresee construction funding becoming available soon. However, without PED, NESP will not be ready to receive those funds.

The inland waterways system has a portfolio of more than 15 high-priority inland navigation projects either under construction or awaiting construction. At the current rate, many of these projects will not even begin construction for the next 20 years.

By conforming the cost-share of the Inland Waterways Trust Fund to the same formula that was approved for the deep draft ports in WRDA 2016, this committee's actions would allow the

navigation capital program to remain operating at or above a $400 million level achieved since the cost-share change at Olmsted, and accelerate project delivery on the portfolio of the critical inland waterways projects.

As you move forward with WRDA 2020 and any potential infrastructure bill, I encourage you to consider this proposal to adjust the cost-share for the construction of inland waterways infrastructure projects. This is an important change that will help advance our Nation's competitiveness and keep America leading at the top.

That concludes my testimony, Madam Chair. Thank you for giving me the opportunity to be here today, and I would be happy to respond to any questions you or other committee members have.

[Mr. Innis' prepared statement follows:]

Prepared Statement of Rob Innis, Plant Manager, Sparrows Point, Maryland, Lafargeholcim, on behalf of Waterways Council, Inc.

Chairwoman Napolitano, Ranking Member Westerman, and Members of the Subcommittee, thank you for the opportunity to speak today on the topic of "Water Resources Development Acts: Status of Implementation and Assessing Future Needs." I believe that my comments today will offer an evaluation of policy changes implemented from past Water Resources Development Acts (WRDA) that have proven beneficial to the inland waterways system and its users, and I will also recommend an important policy change for the modernization of our Nation's inland waterways transportation system.

I currently serve as the Plant Manager of the Sparrows Point slag cement facility in Baltimore, Maryland for LafargeHolcim. LafargeHolcim is the leading global building material and solutions company serving masons, builders, architects, engineers, and major construction companies around the world. We operate in more than 80 countries with over 80,000 employees. LafargeHolcim produces cement, aggregates, concrete, and specialty construction solutions products used in building projects ranging from affordable housing and small, local projects to the largest, most technically and architecturally challenging infrastructure projects. We currently operate 30 facilities along the river system, and in 2018, moved 9.2 million tons by river. If we were to move this tonnage by truck, it would equate to 368,000 more trucks on our roads. We use nearly all of the 12,000 miles of commercially navigable waterways in the U.S., ship on all five of the Great Lakes, load barges out of 10 states, and deliver to 25 states, as well as to Canada. We directly employ over 7,000 people in the United States and supply products to businesses and government that support many more jobs throughout the United States. I am a member of the Board of Directors and Executive Committee of Waterways Council, Inc. (WCI). WCI is the national public policy organization that advocates for a modern and well-maintained system of inland waterways and ports. Recently, I also became Chairman of the Inland Waterways Users Board, and I serve on the Michigan Port Advisory Board.

THE FOURTH "R"

When thinking about transportation infrastructure, the inland waterways system is often overlooked. In actuality, our Rivers are the fourth "R" of a critical multimodal system of Roads, Rail, and Runways. In 2017, more than 578 million tons valued at $220 billion were transported on the inland waterways system. Of that tonnage, almost 80 million tons were aggregates, which is 14 percent of the total tonnage moved along the inland waterways system. Some aggregate and cement projects sourced from the river that Americans benefit from include the new terminal complex at Louis Armstrong New Orleans International Airport, Amazon's Distribution Center in Minneapolis, and the I–90 tollway rebuild from Chicago to Milwaukee.

RECENT SUCCESSFUL POLICY CHANGES IN WRDAS

After only passing two WRDA bills in 14 years, this Committee, starting in the 113th Congress, made WRDA a priority, passing three bills in six years. I would like to thank this Committee for implementing changes in the Water Resources Re-

form and Development Act (WRRDA) of 2014 that have significantly accelerated project delivery on the inland waterways system. A cost-share change at Olmsted Locks and Dam allowed for the Inland Waterways Trust Fund to operate over the last six years at about a 25 percent Trust Fund /75 percent General Fund split. This cost-share change also accelerated the operability of Olmsted, allowing for $600 million in annual national economic benefits to be accrued four years ahead of schedule.

Also enacted in 2014 and taking effect in 2015, the inland waterways industry supported a 45 percent increase to the diesel fuel tax commercial operators pay that is deposited into the Inland Waterways Trust Fund. This is currently the highest federal fuel tax being paid by any transportation mode.

In the Water Resources Development Act of 2016, Congress changed the cost-share model for funding construction of deep draft ports with depths of 45 to 50 feet from 50 percent non-federal sponsor and 50 percent federal government, to 25 percent non-federal sponsor and 75 percent federal government in order to allow ports to expeditiously expand capacity to become post-panamax-vessel-ready. This was necessary to enable our ports to remain competitive on a global scale.

Inland Projects Authorized in WRDA

In WRDA 2007, this Committee created the Navigation and Ecosystem Sustainability Program (NESP), an innovative effort combining two Army Corps of Engineers–Civil Works' key missions, navigation and ecosystem restoration. This program was studied for 13 years at a cost of $74 million. Upon completion of the feasibility study, the Corps of Engineers moved directly to Preconstruction Engineering and Design (PED) for seven years, spending $62 million before being abruptly halted. In 2016, the Assistant Secretary of the Army–Civil Works ordered more studies—an Economic Re-evaluation Report (ERR) before PED could continue to move forward. That ERR is set to be completed in August of this year, but it is still discouraging that there was a restudy of a project that has already seen $136 million and 21 years of time invested. Waterways users, including my company, would like to see the Corps immediately restart PED following this ERR completion. We foresee construction funding becoming available as soon as FY 2023. However, without PED, NESP won't be ready to receive those funds. We are discouraged by this delay and note that projects recently authorized are already receiving PED.

For example, WRDA 2016 authorized the Upper Ohio Navigation Project for $2.7 billion. This project has received PED funding the last two fiscal years. Also, WRDA 2018 authorized the Three Rivers project for $180.3 million, and that project received PED funding last fiscal year.

MODERNIZING THE INLAND WATERWAYS TRANSPORTATION SYSTEM

The inland waterways system has a portfolio of more than 15 high priority inland navigation projects either under construction or awaiting construction. At the current rate, many of these projects will not even begin construction in the next 20 years. By conforming the cost-share with the Inland Waterways Trust Fund to the same formula that was approved for deep-draft ports in WRDA 2016, this Committee's action would allow for the inland navigation capital program to remain operating at or above a $400 million level achieved since the cost-share change at Olmsted, and accelerate project delivery on that portfolio of critical inland waterways projects.

As you move forward with WRDA 2020 and any potential infrastructure bill, I encourage you to consider this proposal to adjust the cost-share for construction of inland waterways infrastructure projects. This important change will help advance our Nation's competitiveness and keep America as the leading and most dependable source of goods and materials. I'm happy to share additional information with Members and your staff.

That concludes my testimony, Madam Chair. Thank you for giving me the opportunity to be here today, and I will be happy to respond to any questions you or the other Committee Members may have.

Mrs. NAPOLITANO. Thank you, Mr. Innis.

Mr. Berginnis, you are next.

Mr. BERGINNIS. Good afternoon, Chairwoman Napolitano and Ranking Member Westerman. I am Chad Berginnis, executive director of the Association of State Floodplain Managers, and I am honored to be here today.

As we contemplate the most recent round of flooding and the damages that have been caused in the Central U.S., in our coastal areas, and even as the result of the failure or near failure of flood control structures like Oroville Dam, we must recognize that as a Nation, our current approach is being outpaced by rising seas, more intense rainfall events, and skyrocketing flood damages.

Our members are on the front lines of this battle for a decade, and we have advocated for sensible policies to reduce flood damages and recognize natural functions of flood plains.

Our written testimony contains over 20 recommendations, and we would like to highlight a few of those today.

First, we need a coherent flood management policy to complement our flood control efforts. Among those identified in our testimony, three critical ones are making room for our rivers and setting levees and other flood control structures back, harnessing the benefits of natural infrastructure, and using nonstructural measures wherever possible, whenever and wherever structural measures are contemplated.

Throughout the Corps program's guidance, there is a systematic bias towards structural projects and against nonstructural projects. We must ensure that Federal programs like Public Law 84–99 not only require the analysis of such options but establish a preference for them.

Second, guidance documents like principles and guidelines that steer solutions toward those that maximize national economic development need to be replaced by guidance that prioritizes national economic resiliency and sustainability.

We need to complete national studies, such as those authorized under section 2032 of the 2007 WRDA, which analyzes the Nation's vulnerability to flooding.

We must also ensure that regional studies that are being done for such areas, such as the Southeast and gulf coast and even those that are called for on the Missouri, are fully inclusive of all flood loss reduction tools, including nonstructural.

Third, we believe that there should be organizational changes in the Corps that unlocks the massive knowledge and expertise of its staff for the benefits of the Corps itself and all communities by making technical assistance a top priority.

Today's reality is that the Corps employees cannot even lead local workshops without some specific project to pay for it. There were lots of comments earlier today about how the Corps can leverage the expertise, especially in small and rural communities. This is one way to do that.

Internally within the Corps, there are Centers of Expertise like the National Nonstructural Committee, whose role is to advise both internal customers and Corps districts, but also communities and the general public. But these are so under-resourced that they can serve neither very well.

This also means that we leverage the good research and development that is being done by the Corps and ensure that it is adopted throughout the agency and disseminated to the public.

For example, the Engineering with Nature Initiative uses natural processes and systems in concert with engineered systems to

produce a more diverse array of economic, environmental, and social benefits.

ASFPM hopes that it is adopted widely within the Corps.

In a unique public-private partnership with ASFPM and FM Approvals, the National Flood Barrier Testing and Certification Program helps develop and use consensus standards for flood abatement products.

But in the 5 years since the standard has been in existence, we have yet to see the Corps include the standards in its policies, procedures, or contracts for flood fighting materials agencywide. We note that some of the flood fighting products that were used and failed in Iowa this past spring were not certified.

Finally, we must vastly improve how we communicate flood risk. Over the last decade we have seen the creation and availability of online databases like the National Inventory of Dams and National Levee Database, and these are very promising developments. But they are missing critical information.

None is more pressing than the information we have chosen to withhold from the public, inundation mapping where flood control structures are operational or where they fail. Since 9/11, this information has been categorized as for official use only.

Yet when we have incidents like the near catastrophic event at Oroville Dam in California or the Barker and Addicks Reservoirs in Texas, it is unacceptable that tens of thousands of people in harm's way are unaware of their flood risk.

I hope that these observations and recommendations help better inform your work on the next WRDA, and I thank you for your time.

[Mr. Berginnis' prepared statement follows:]

Prepared Statement of Chad Berginnis, C.F.M., Executive Director, Association of State Floodplain Managers, Inc.

INTRODUCTION

The Association of State Floodplain Managers (ASFPM) appreciates the opportunity to share observations about the programs of the U.S. Army Corps of Engineers (Corps) and their implementation as part of the Committee's oversight.

The 19,000 members of ASFPM are partners of the Corps, Federal Emergency Management Agency (FEMA) and other federal agencies at the state and local levels in reducing loss of life and property due to flooding. Our 37 state chapters are active within their states and often nationally as well. State and local floodplain managers and their private sector engineering and floodplain management colleagues interact regularly with the Corps at the Headquarters and District levels in developing and implementing solutions to flooding challenges.

Floods are the nation's most frequent and most costly disasters every year and the costs to taxpayers continue to increase. While the Corps has often successfully engineered structural means of controlling flood waters, it is becoming more and more apparent that 1) operation and maintenance costs are exceeding the ability of communities to pay those costs, which is their obligation; 2) structural projects, while necessary in some instances, are expensive: 3) traditional projects can inadvertently increase flood hazards upstream, downstream and across the river and 4) nonstructural projects can often offer a less expensive, more sustainable and affordable means of reducing flood hazards.

To meet today's challenges of riverine and coastal flooding in an era of more frequent and severe storms, sea level rise, and skyrocketing disaster costs, it is important that the Corps take a broad, comprehensive and watershed-based view of overall flood risk management. To encourage enhanced effectiveness in addressing cost considerations, the need to protect lives and property, and recognize the multiple

beneficial functions of the natural floodplain, ASFPM would like to discuss several areas where improvement is needed. We will address:

- Strategic Direction
- Flood Risk Management
- Levee and Dam Risk Management
- Public Law 84–99 program
- Principles and Guidelines

STRATEGIC DIRECTION

"*The current trajectory of funding water resources projects is not sustainable*."

This was the take-home message at the 2012 USACE Strategic Leadership Conference attended by ASFPM as well as several other Corps partners. In remarks made by senior Corps leadership—with which ASFPM is in agreement—when you look long term, the Corps must change how it is doing business. An increased focus on collaboration and problem solving with partners will be necessary as will making smarter, strategic investments in infrastructure. Given the increasing cost of operations and maintenance, funding for new starts and other projects is being proportionately reduced. Simply put, as a nation, we cannot afford to keep doing business as we have in the past. More frequent and intense disasters are making current approaches too costly or rendering them ineffective.

A more recent troubling trend is that more and more project funding is coming by way of supplemental appropriations after disasters. Such a piecemeal approach is nearly impossible to plan for and creates a lot of frustration at the state and local level.

The Corps is uniquely positioned, with Congressional support, to help transform itself and take a different, much more collaborative approach. Rare among agencies, the Corps allocates significant resources for research and development through entities like the Institute for Water Resources, and has a long history of expertise in all aspects of flood-loss reduction—both structural and nonstructural. Centers of expertise such as the USACE National Nonstructural Floodproofing Committee focus on measures to reduce the consequences of flooding versus reducing the probability of flooding. The successful Silver Jackets program is putting the Corps into a new "convener" role. Initiatives like Engineering with Nature and the USACE partnership with ASFPM in the National Flood Barrier Testing and Certification Program [https://nationalfloodbarrier.org/] are forging new paths, leveraging new technologies and approaches to tackle long-standing flood problems.

Technical Assistance

Technical assistance should be seen as a cornerstone of Corps operations and activities. A significantly enhanced role of technical assistance and broad-based problem solving/planning for watershed wide and nonstructural solutions would more effectively deliver federal expertise at the local level. However, it is still nearly impossible to leverage Corps expertise on more of an ad-hoc basis, not associated with a particular Corps project. While Silver Jackets has helped this at the state level somewhat, it is a sad reality that Corps expertise is rarely available at the local level unless there is an active project. Other federal agencies dealing with flooding issues such as FEMA, NRCS, and the USGS have staff available through their disaster cadres, capacity building programs at the state level, national call centers, or distributed staff throughout the U.S. Each is a different model for providing federal resources at the local level. Given that the Corps has 45 districts throughout the United States, the basic infrastructure exists to provide a much better technical-assistance role than it currently provides. By having a more robust technical-assistance role at the district level that is not project related, the research, expertise and knowledge of the Corps could be made much more widely available.

The Floodplain Management Services (FPMS) [https://www.nae.usace.army.mil/Missions/Public-Services/Flood-Plain-Management-Services/] program (authorized as a continuing authority under Section 206 of the 1960 Flood Control Act) theoretically addresses this need and has provided valuable and timely services in identification of flood risks and flood damage. The program enables the Corps to support state, regional and local priorities in addressing flood risks through collaboration and cooperation by developing location-specific flood data, which can be used to reduce overall flood risks. Like FPMS, the Planning Assistance to States (PAS) program was also authorized to provide valuable and timely services in identification of flood risks and flood damage. This program also allows for any effort or service pertaining to the planning for water and related resources of a drainage basin or larger region of a state, for which the Corps of Engineers has expertise. These programs have been shown to provide significant benefits for a relatively small invest-

ment. By providing Corps expertise, these programs assist states and communities to make better informed decisions and to engage in more comprehensive consideration of their flood risk and the various options for reducing the hazard. These can be structural, nonstructural or a combination of the two and can often lead to less expensive and more sustainable solutions.

However, FPMS and PAS must be better managed as national programs. While our data is anecdotal, it appears that these two programs are not evenly nor consistently administered throughout the country. Certain Corps Districts have high expertise and capability with these programs and others do not. We know thorough our work with the Corps that there do not seem to be mechanisms or processes to comprehensively identify, collect, review and prioritize requests for FPMS/PAS services, review projects completed, and adjust program metrics in any consistent manner. ASFPM believes the demand for these programs significantly exceeds available resources. All Corps Districts should have the level of capability as do those that regularly use FPMS and PAS. Another issue is that the Corps tends to "projectize" these services versus making the technical assistance more broadly and widely available.

Technical assistance is especially important after flood disasters. Given the current structure and focus of the Corps—most post-disaster work has been focused on immediate response missions related to infrastructure and public works and flood response activities (flood fighting) and repair/rehabilitation work. However, given the Corps expertise and assets, they can also be brought to bear in providing technical assistance and problem-solving expertise. For example, post-Sandy, many of the affected areas have a critical need to understand the range of different nonstructural flood mitigation options available to them, however, this has been done only haphazardly in the past.

- Develop a significantly more robust and ongoing non-project related technical-assistance role for the Corps at the district level, either through FPMS or a new authority. The FPMS and PAS programs should be authorized at least $50 million each.

The Corps can play a lead role in a model where the federal government provides incentives to undertake sustainable solutions, where it provides the technical know-how and expertise to solve a flooding problem, or where it provides data and information to enable states and communities to make better decisions.

Research & Development

The Research and Development function of the Corps has several promising initiatives and programs, but as we have seen with other R&D initiatives across the federal government, the difficulty lies in widespread implementation of these initiatives into an agency's operations.

The first of these is the Engineering with Nature (EWN) [https://ewn.el.erdc.dren.mil/index.html] initiative that is the intentional alignment of natural and engineering processes to efficiently and sustainably deliver economic, environmental and social benefits through collaboration. It incorporates the use of natural processes to maximize project benefits. ASFPM is very supportive of this initiative and is encouraged by its results and implementation strategy. The 2018–2022 EWN strategic plan properly focuses on expanding implementation. However, given the traction we have seen with other initiatives such as the nonstructural flood mitigation, we are concerned about its ultimate success.

- Congress should set policy on decision making that will result in natural infrastructure being a preferred alternative due to its multi-benefit approach
- The Corps should commit to fully supporting the operationalization of the EWN initiative throughout the agency.

The second of these is the National Flood Barrier Testing and Certification Program (NFBTCP) [https://nationalfloodbarrier.org/]. A partnership among ASFPM, FM Approvals and the Corps (through the Engineer Research and Development Center (ERDC)), the NFBTC Program is a unique public-private partnership, which resulted in the development of the ANSI 2510 standard and where commercial flood abatement products (i.e., perimeter flood barriers and flood mitigation pumps) are tested against that standard. The purpose of this program is to provide an unbiased process of evaluating products in terms of resistance to water forces, material properties and consistency of product manufacturing. Manufacturers pay for the cost of testing and certification and the public benefits from having flood abatement products that meet standards. While the European Union has recently adopted the ANSI 2510 standard, we have yet to have it adopted officially in the United States. This program and the Corps' participation in it aligns with Section 3022 of the 2014 WRRDA encouraging the Corps to use durable and sustainable materials and resist-

ant construction techniques to resist hazards due to a major disaster, and aligns with Director Dalton's embrace of new technologies.

We must ensure the ERDC water testing facility is capable of testing products being demanded by the marketplace. Currently, the facility is only capable of testing perimeter barriers to a height of 4 feet, yet manufacturers are making products that would protect to heights of 8–10 feet or more. The current facility is in need of a significant upgrade and/or replacement and ASFPM would be most supportive of such an effort.

Planning and the Use of Nonstructural Flood Risk Reduction Measures

Overall, ASFPM is concerned about the lack of nonstructural, flood-risk reduction measures as part of the projects that the Corps is implementing. While the agency has the authority to implement a full array of nonstructural measures, today we are seeing very few of these measures being implemented. Yet these measures have been identified in community hazard mitigation plans and other planning documents. It seems that if a project has not gone through a formal Corps planning process then it does not formally exist. Better coordination between the Corps and existing community plans, which have proliferated over the past 20 years (largely as a result of the Disaster Mitigation Act of 2000) is essential. As we note later in this testimony, nonstructural, flood-risk reduction measures have an inherent disadvantage in most Corps program whether it be through PL 84–99 or as a result of the Principles and Guidelines. Yet, the array of adaptation techniques that coastal and inland communities will need to take advantage of will have to include nonstructural measures or measures that can include a combination of both. For example, relocating from a highly flood-prone area is a very popular measure and will be increasingly important in the future. ASFPM encourages the Corps to identify and remove systemic biases against nonstructural, flood-risk reduction measures and elevate the status of such measures strategically.

ASFPM supports the recent request by Assistant Secretary of the Army for Civil Works R.D. James that Congress provide authority for the Corps to conduct a study of the Missouri River levees as part of a system-wide study that would look as reservoir operations and all levees to evaluate how the systems should be managed, (especially whether levees should be rebuilt, moved back to reduce erosion and provide conveyance or removed and see if other mitigation options employed like buyouts or elevation of buildings, which would be more effective and less costly). One emerging trend we have observed nationally that might have applicability on any Missouri River system study, for example, is concern over the flood control—including large reservoir releases—and how we might make changes in the USACE water control manuals for flood operations to reflect new conditions such as more intense storms.

FLOOD-RISK MANAGEMENT

The Corps' Flood Risk Management Program was established in 2006. The program's mission is to increase capabilities across all aspects of the agency to improve decisions made internally and externally that affect the nation's flood risk. It implements this mission through several activities including technical assistance, project planning and construction, promotion of nonstructural flood risk reduction, flood fighting, post flood disaster support, and assessing potential climate change impacts and consideration of adaptation measures. Operationally, we would like to share our observations and suggestions for improvement.

ASFPM believes that overall the Silver Jackets program has proven to be successful and should continue with maximum flexibility to address individual state's needs and issues. There have been many benefits to the Corps, and states, tribes, and local governments from the Silver Jackets program including better coordination and understanding of the various programs and agencies involved in comprehensive flood-risk management, identification and coordination of resources, and development and undertaking of collaborative projects. It is important; however, that all Silver Jackets POCs from the Corps embrace the role and vision of the program.

As mentioned above, the Corps is a partner in the NFBTC Program. One step to facilitate the recognition and adoption of the standard would be for the Flood Risk Management Program—through the National Flood Fight Material Center—to require the standard in future contracts when purchasing flood fighting materials (there are several manufacturers that now have certified products). While we have had promising talks with Director of Civil Works Dalton and Chief Delp in the Rock Island District, we are concerned about support of the program and use of the standard operationally within the Corps' Flood Risk Management program overall given our lack of progress to date.

- Encourage the adoption of and operational use of the ANSI 2510 standard by the USACE for flood abatement products

The center of expertise for the Corps for nonstructural flood-risk reduction rests with the National Nonstructural Committee within the Planning Community of Practice. While we are encouraged after a brief dissolution and reconstitution of the NNC the past couple of years, that there is at least some interest in maintaining this function within the Corps, we continue to be alarmed about its significant lack of human resources, the stove-piping of the committee (within the Planning Division) and agency headquarters support/champion.

LEVEE & DAM RISK MANAGEMENT

ASFPM has developed positions on structural flood control including the position that levees should never be seen as the only flood mitigation tool, but part of a mix of tools that include nonstructural measures like buyouts, building elevations and flood proofing, as well as levee setback or realignment, designed overflow spillways in levees and floodways, such as those on the lower Mississippi River that provide "room for rivers." Furthermore, all levees and other flood control structures must be designed for future conditions that can be expected during the life expectancy of the structure. If the levee has a 50-year life, it must be able to handle the design flood expected in 50 years. All structural projects can result in adverse impacts. It is important that the Corps examines and enforces requirements to prevent or mitigate any adverse impacts (social, economic, environmental) from construction, repair and rehabilitation of structural projects, prior to or concurrent with the construction of projects.

As we reflect back on past levee related policies, we are reminded of the many recommendations from the Sharing the Challenge: Floodplain Management into the 21st Century Report of the Interagency Floodplain Management Review Committee [https://usace.contentdm.oclc.org/digital/collection/p266001coll1/id/2471/] led by General Gerald Galloway after the 1993 Mississippi River floods. One recommendation never enacted was a new law to define the responsibilities of federal, state and local governments, including the levee districts that build and maintain locally-funded levees.

Despite enormous public investment in flood "control" structures, that spending has been outpaced by development in risky areas and development in the watershed that increases runoff and flooding, and by the gradual deterioration of the protection provided by those structures. As the public grows to recognize the risks associated with levees, communities are working to evaluate the various actions they can take in response to those risks: levees can be repaired and improved or set back from the river to relieve pressure and erosion on the levee; homes, businesses and infrastructure at risk can be relocated to reduce risk and restore floodplain function. Waters can be detained upstream or adjacent to the stream by re-opening areas closed to flood storage and conveyance, such as Napa, California did. And measures can be combined to achieve the most effective results with scarce public dollars, with a particular eye to reducing the long-term operations and maintenance (O&M) costs for communities and taxpayers.

- Congress and the Corps should adopt policies for new or reconstruction of levees that encourage levees are set back from the water's edge to preserve riparian areas, reduce erosion and scour, reduce flood levels and flooding risks, and to allow natural floodplain ecosystems to better serve their natural functions.

We have entered an era of levee "triage"—the process of prioritizing federal response to flood risks associated with levees and rationing scarce federal taxpayer dollars on multiple-objective risk reduction projects that may include floodplain restoration, reconfiguration of structural systems, and combinations of approaches to make the best use of limited public resources.

Generally speaking, any new federal taxpayer funding program for flood risks associated with levees should be reserved for the top performers (communities and regions) that have demonstrated nonfederal leadership in the identification and reduction of flood risk associated with levees. Projects need to address those risks by leveraging more fully state and local authorities over land use, infrastructure protection, development standards and robust building codes. Additionally, eligibility for a new levee risk management fund should require that nonfederal partners take specific steps to address flood risk associated with levees in the following ways:

1. Participate in the National Flood Insurance Program;
2. Adopt a FEMA approved Hazard Mitigation Action Plan that includes emergency action and planning for residual risk areas associated with all levees and

residual risk areas in their jurisdiction, including post-flood recovery and resiliency;

3. Prevent the construction of critical facilities in areas subject to inundation in the 0.2%-chance floodplain, and require that all existing CFs be protected, accessible and operable in the 0.2%-chance flood;
4. Evaluate the full array of nonstructural measures to reduce risk, implement effective nonstructural measures in combination with any structural measures that are selected, and adopt standards to prevent any post-project increase of risk (including probability and consequences), prior to any commitment of public funds toward levee work;
5. Demonstrate binding and guaranteed financial capacity and commitment to long-term operations and maintenance, rehabilitation and management of all levee structures and system components in the community's jurisdiction;
6. Adopt short- and long-range flood risk reduction planning in residual risk areas as part of the community's mitigation, development and land use planning;
7. Communicate with property owners in residual risk areas, including spillway easement areas, to notify them of their risk, advise them of the availability of flood insurance, update them on emergency action plans, report on levee operations and maintenance over the past year, and for other public notification and engagement activities; and
8. Consideration of flood insurance behind levees either through individual policies or with a community-wide policy. The rate should be commensurate with the risk (higher levee protection, lower cost policies).

ASFPM would like to note some positive developments in recent years regarding levee and dam risk management. The first of those has been the development of and public access to the National Levee Database (NLD) [https://levees.sec.usace.army.mil/#/] and National Inventory of Dams (NID) [https://nid.sec.usace.army.mil/ords/f?p=105:1]. ASFPM was pleased to see the opening of the NLD for public access in 2018 (this follows the public access to NID, which occurred in 2015). This is an important evolution in the levee risk management to ensure the public has access to essential information regarding these flood-risk management structures. According NLD, there are nearly 30,000 miles of levees with over 46,000 levee structures having an average age of 55 years.

Another positive development was the Corps' new policy [https://www.publications.usace.army.mil/Portals/76/Publications/EngineerCirculars/EC_1110-2-6074.pdf?ver=2018-01-22-100438-250] on Emergency Action Plans (EAPs) and required inundation mapping (EC 1110–2–6074). This policy standardizes inundation mapping and establishes inundation mapping requirements for dams and levees. In theory, having inundation mapping available to the public can help avoid debacles like those we witnessed around Barker and Addicks Reservoirs post-Harvey when thousands of homes in inundation areas of those structures were impacted. Had local land use planners, property owners and others been aware of these risks, steps could have been taken to reduce that risk. However, the new EAP policy includes the following statement: *EAP maps are considered sensitive data and must be marked For Official Use Only according to AR 380–5 and DoDM 5200.01.* In other words, inundation maps associated with EAPs are not publically available. Why would we be withholding this vital information on flood risk?

The answer seems to be policy artifacts post 9/11 that neither the Corps (DoD) nor FEMA (DHS) are willing to overcome. The Technical Mapping Advisory Council (TMAC), a congressionally-authorized advisory committee helping FEMA oversee the nation's flood mapping program, in its 2016 report National Flood Mapping Program [https://www.fema.gov/media-library-data/1474555532007-c063547f6f48026feb68c4bcfc41169d/TMAC_2016_National_Flood_Mapping_Program_Review_Updated.pdf] Review, identified a legacy DHS policy through its Security Classification Guide for the Protection of Critical Infrastructure and Key Resources, which listed dam failure inundation maps as "For Official Use Only." However, this policy conflicts the National Flood Mapping Program requirements that such areas be provided on Flood Insurance Rate Maps and on publically-available databases such as NLD and NID. As noted in the report, a Virginia law passed in 2008 essentially requires that all inundation mapping developed for state-regulated dams be made available to communities and the public. This has now been implemented for a decade without issues and state officials there believe in supporting wider public availability of these data. More recently, when speaking to agency officials, there has been a mistaken belief that this issue had been dealt with. It is clear to ASFPM that it has not and the unwillingness of agencies to act on it demands congressional intervention.

- Congress should mandate that inundation mapping developed by the federal government and/or associated with federal programs for dams and levees be made publically available.

Let's not have a recurrence of the Oroville dam situation from a couple years ago where a quarter million people were told to evacuate because the dam's integrity was threatened, and none of them even knew they would be inundated if the dam were to fail. This is a critical public safety issue that must be addressed.

Moving from an inventory to a program to address the safety of levees and to get a handle on the funding needed to ensure the safety of levees is not a simple process. Evaluating how safe a levee is can be easier if actual engineering plans exist and there is a record of the operation and maintenance of that levee. Unfortunately, many of the non-federally built levees have neither good plans nor O&M records. Engineers can do a field evaluation of a levee that includes a visual inspection, but that does not tell us what the material is inside the levee to determine if it will withstand flood levels at a design flood or a larger flood. It is also questionable if the Corps should conduct evaluations beyond visual for non-federal levees using taxpayer funds.

All the above evaluations are complicated because so many nonfederal levees are simply dirt piled up to keep water from farm fields, with more dirt added to the levee over time to make it higher, especially when housing or other development occurred behind the levee. Just because such a levee has not failed over the years does not mean it will not fail in the next flood. Requiring levee owners to perform an analysis of the levee to determine its adequacy and to develop a plan to properly operate and maintain the levee cannot be done by the Corps because the federal government does not have land use authority. States do, but many states to not regulate, or do not have adequate regulations to ensure levees are adequate.

As a nation, we know little about the condition or risks associated with levees outside the Corps portfolio. Managing risks associated with levees in the United States will require diligence and cooperation among all levels of government, private sector and the public. Further, the national program must be integrated into and work seamlessly with other flood-risk management efforts through other agencies. That is why the implementation of the National Levee Safety Program is urgently needed. ASFPM participated in the multi-year effort to develop recommendations for a National Levee Safety Program culminating in a report [http://cdm16021.contentdm.oclc.org/utils/getfile/collection/p16021coll2/id/444] with 20 recommendations made in 2009. The 2014 WRRDA [https://www.congress.gov/113/plaws/publ121/PLAW-113publ121.pdf] first authorized the program, which was subsequently reauthorized in America's Water Infrastructure Act of 2018 through federal fiscal year 2023. Among other things, this program will:

1. Establish comprehensive national levee safety guidelines for uniform use by all federal, state, tribal and local agencies (which would also provide for adaptation to local conditions);
2. Require better coordination and use of consistent standards and guidelines among federal agencies;
3. Establish a hazards classification system for levees;
4. Assist states, communities and levee owners in developing levee safety program including identifying and reducing flood risks associated with levees;
5. Focus on educating the public of risks living in leveed areas; and
6. Establish a levee rehabilitation program that is *integrated* with ongoing community hazard mitigation programs/plans and requires a practical floodplain management plan to address adverse impacts of flooding in leveed areas.

ASFPM is pleased to see that finally, the House passed "minibus" spending bill, H.R. 2740, included increased funding for the National Levee Safety Program. While it does not fund the program at its full authorization of $79 million, it does provide $18 million.

- ASFPM recommends full implementation of the National Levee Safety Program and ensures that national levee safety guidelines fully account for future flood conditions based on the levee's anticipated service life (as opposed to design life) and suggests appropriate land-use standards to manage the intensification of risk behind levees.
- Activate the National Levee Safety Committee (NLSC) of federal agencies, state and local stakeholders, professional associations, and experts as directed in WRRDA 2014 to assist the secretary to develop consistent guidance for levee siting, design, construction, operating and management standards, to enhance levee performance, set appropriate protection levels, and to build-in resilience and adaptability for existing and future levee-based systems, (e.g., freeboard, spillways, setbacks, etc.).

An effective National Levee Safety Program would mandate or incentivize states to have levee safety programs. This could be done by providing federal taxpayer funding to repair levees on some cost sharing basis, but it should have provisions indicating the funding will only be available in states with adequate levee safety programs where the state can regularly inspect levees and has the authority to order repairs or removal of inadequate levees so that people and businesses behind the levee do not have a false sense of security that the levee will protect them. The authorized Corps Levee Safety programs needs to be implemented with these provision included.

We want to point out one recommendation contained in the 2009 National Levee Safety Program report that was not implemented in the 2014 WRRDA, but that ASFPM still fully supports: *A requirement for the purchase of risk-based flood insurance in leveed areas to reduce economic loss, flood damage, and increase understanding of communities and individuals that levees do not eliminate risk from flooding*. Had such a requirement been in place, the effects from this year's flooding in the Midwest, especially where levees overtopped and failed, would have been far less consequential.

It has come to light in recent years that many levees on the Mississippi River have been raised above their authorized height. The problem with that is the higher levees at one point in the river will result in more flooding across the river or upstream and downstream of that higher levee because the water has to go somewhere. This can lead to "leapfrog levee," where levee owners on the other side of the river then raise their levee higher, and the cycle continues.

- ASFPM urges strong continued federal oversight of levees to maintain levees at authorized levels. This should be done by the Corps or FEMA, and it must be adequately enforced.

We were pleased to see that ASA R.D. James and Deputy Commanding General for Civil and Emergency Operations Maj. Gen. Scott Spellman understand the issue. Spellman indicated that changes to any one levee on the system could cause more problems downstream.

One final note regarding the High Hazard Dam Rehabilitation Program—ASFPM strongly supports the floodplain management planning requirement to obtain funding and integration of the dam rehabilitation with other mitigation efforts. We believe that such plans must be practical and implementable so that those impacted better understand flood risk and can take steps to mitigate against the residual risk.

ADJUSTMENTS TO P.L. 84–99

P.L. 84–99, the Corps' disaster assistance authority, is legislatively built on language that was first adopted in 1941. In recent WRDAs, we have generally seen only incremental changes, while at the same time costs of flood disasters are increasing dramatically, while we are recognizing our overall approaches to flood-risk management require substantial new direction. As an example, P.L. 84–99 provides by far the most generous cost-sharing formula of all the Corps' activities, to assist in repair and rehabilitation of disaster-damaged levees and hurricane and storm damage reduction projects. In many cases the repairs are coming at high federal taxpayer expense and are being repeated over and over without serious review because current policy constrains or bars the Corps from studying and recommending changes (and makes even the consideration of nonstructural approaches subject to a non-federal sponsor's consent).

Under P.L. 84–99, the Chief of Engineers, acting for the Secretary of the Army, is authorized to undertake activities including disaster preparedness, advance measures, emergency operations (flood response and post flood response), rehabilitation of flood control works threatened or destroyed by flood, protection or repair of federally authorized shore protective works threatened or damaged by coastal storm, and provisions of emergency water due to drought or contaminated source. P.L. 84–99, which is the principle Corps program to repair and rehabilitate, incorporates a significant bias against nonstructural and integrated approaches (combining structural and nonstructural approaches) to rehabilitation and repair of flood control works (FCWs). ASFPM understands that Engineering Regulation 500–1–1, which is the operational guidance for P.L. 84–99, has been on-again-off-again process of being under consideration for updating for several years. ASFPM believes that it is essential for the program to incorporate a much greater focus on nonstructural approaches.

The Rehabilitation and Inspection Program (RIP) provides for inspections of FCWs, the rehabilitation of damaged FCWs, and the rehabilitation of federally-authorized and constructed hurricane or shore protection projects. Any eligible FCW

that was damaged by water, wind or wave action due to a storm is eligible for repair under RIP, either at 100% or 80% federal taxpayer cost. RIP assistance is available to federally- and non-federally built FCWs. Operation and maintenance is the responsibility of the local sponsor, and so long as there is proper and timely maintenance, the FCW can be included in the program. Currently, the following FCWs can be included, provided they meet the eligibility inspections:

1. Federally-authorized and constructed hurricane or shore protection projects (HSPPs).
2. Federally-constructed, locally maintained levees and floodwalls.
3. Non-federally constructed, locally-maintained levees and floodwalls that provide a minimum of a 10-year level of protection with 2 feet of freeboard to an urban area, or a minimum of a five-year level of protection with 1 foot of freeboard to an agricultural area.
4. Federally-constructed, locally-maintained flood control channels.
5. Non-federally constructed, locally-maintained flood control channels that provide a minimum of a 10-year level of protection. [NOTE: Interior drainage channels within the protected area of a levee system are not flood control channels.]
6. Pump stations integral to FCW.
7. Federally-constructed, locally-maintained flood control dams.
8. Non-federally constructed, locally-maintained flood control dams.

This is a very broad range of infrastructure for which the Corps takes responsibility after declared disasters, much of which is provided through supplemental appropriations through the Flood Control and Coastal Emergencies account. An unfortunate side effect of the current eligibility standards is that non-federal entities responsible for operations, maintenance and repairs are driven to defer maintenance until after the system is damaged by a flood event. P.L. 84–99 eligibility needs to be modified to assure that any federal investment in levee work targets structures that pose the greatest public safety risk, and incentivizes responsible nonfederal actions in levee operations, maintenance and repair.

- Conform this program's cost-sharing with other flood-damage reduction programs to reduce federal disaster costs, reduce risks and support greater use of comprehensive flood-risk management and nonstructural approaches.

Since this program provides significant federal taxpayer dollars for repair and rehabilitation of levees and dams for which local entities have signed operation and maintenance agreements, it seems entirely appropriate to associate a set of requirements to be met by those entities in order to qualify for federal assistance. ASFPM recommends that eligibility for P.L. 84–99 be available only after the following steps have been taken:

- The entity responsible for operation, maintenance and repair (OM&R) has adopted and demonstrated compliance with an approved OM&R plan.
- Responsible entity must communicate annually with property owners in residual risk areas, including dam or levee failure and spillway easement areas, to notify them of their risk, update them on emergency action plans, report on levee operations and maintenance over the past year, and for other public notification and engagement activities.
- Responsible entity must demonstrate binding and guaranteed financial capacity and commitment to long-term operations and maintenance, rehabilitation, and management of all levee structures and system components in the community's jurisdiction;
- Jurisdictions in residual risk areas must:
  - Participate in the NFIP,
  - Adopt a FEMA approved hazard mitigation action plan that includes emergency action and planning for residual risk areas associated with all levees and residual risk areas in their jurisdiction, including flood-fighting, post-flood recovery and resiliency, and
  - Prevent wherever possible the construction of new critical facilities (CFs) in areas subject to inundation in the 0.2%-chance floodplain, and require that all new and existing CFs be protected, accessible and operable in the 0.2%-chance flood.

P.L. 84–99's treatment of nonstructural options is limited. ER–500–1–1 indicates:

> Under P.L. 84–99, the Chief of Engineers is authorized, when requested by the non-federal public sponsor, to implement nonstructural alternatives (NSAs) to the rehabilitation, repair, or restoration of flood control works damaged by floods or coastal storms. The option of implementing an NSA project (NSAP) in lieu of a structural repair or restoration is available only to non-federal public

sponsors of FCWs eligible for Rehabilitation Assistance in accordance with this regulation, and only upon the written request of such non-federal public sponsors.

Unfortunately, this is consistent with the underlying statutory language, first adopted in WRDA 1996. The result? Little or no consideration of nonstructural measures, even when such measures could be more cost-effective, and more consistent with the Corps' re-released Environmental Operating Principles and subsequent policy guidance from Corps leadership.

The reality is that funded work should evaluate the full array of nonstructural measures to reduce risk, implement effective nonstructural measures in combination with any structural measures that are selected, and adopt standards to prevent any post-project increase of risk (both probability and consequences), prior to any commitment of public funds toward levee work. Since nonstructural options are only considered on an "as requested basis," the requirement that the repair or rehabilitation approach be the "least cost to the government" alternative cannot logically be met because in the vast majority of the cases, not all alternatives are being evaluated. We can no longer afford to ignore possibly less expensive nonstructural alternatives. Specific modifications needed include:

- For every project, explicitly require consideration of realigning or setting back levee segments, and integrating setback levees to the fullest practicable extent in any federally-funded levee work, including repairs under P.L. 84–99.

Levee setbacks improve public safety and environmental management and help account for and mitigate current and future uncertainties and reduce the risk of failures as well as improve floodplain and natural ecological functions.

In Sec. 1160 of WRDA 2018 Congress added realignment as a potential P.L. 84–99 rehabilitation option, but, again, has left this up to local sponsors whether even to consider. We specifically urge removing the present constraint requiring the Chief of Engineers to obtain a sponsor's consent to study or recommend such alternative actions. We would also urge that funding be made available to conduct such alternative analyses wherever appropriate, particularly in any situation with a history of repetitive P.L. 84–99 repairs. This important modification to P.L. 84–99 can help reduce "pinch-points" in levee systems and bridge crossings that are often damaged or fail in repeated flood events, resulting in continued property loss, economic disruption and federal spending on repairs and disaster payouts. In cases of repeated levee failures or where existing levee alignments create significant pinch points or other risks, the Chief of Engineers should be able to initiate consideration of options to reduce long-term risks and repair costs.

- Congress and the Corps should remove bias towards structural projects and against nonstructural projects.

This includes consideration of nonstructural measures in every instance and not solely at the request of the sponsor; removal of funding caps for nonstructural measures; reconsider the present policy which requires local sponsor to provide all lands easements, rights of way, relocations and disposal areas (LERRDs) for nonstructural projects to allow federal funding for lands for nonstructural project rehabilitations; provide greater equivalency in repairs to nonstructural measures after a subsequent flood event; and requirement for consideration of benefits and costs over the long term, which should recognize and incorporate the non-commercial and societal benefits of nonstructural and nature-based design approaches in P.L. 84–99. Other ASPFM recommendations include:

- Including a provision for expedient buyouts of structures and land under P.L. 84–99. Due to the existing bias against nonstructural measures, this is not now currently feasible. However, these should be pursued with the same expediency as levee repairs just after a flood has occurred, versus through the normal project development process.
- Requiring the Corps to identify and report on frequency and losses associated with repetitive loss levees and other P.L. 84–99-supported flood control works.
- Requiring a full suite of flood-risk mitigation options (including relocation or realignments, setbacks and nonstructural approaches to reduce costs and risks) for P.L. 84–99 assistance (similar to NFIP and Stafford Act repetitive loss mitigation).

Consideration should be given to reducing federal subsidies in P.L.84–99 as the repetitive costs and disaster assistance claims rise.

REVISION OF USACE PRINCIPLES AND GUIDELINES (P&G)

Federal activities and Corps investments in water resources and flood-control projects have been guided by a process that has remained largely unchanged for 30 years, despite a growing record of disastrous floods. The first set of "Principles and Standards" was issued in September 1973 to guide the preparation of river basin plans and to evaluate federal water projects. Following a few attempts to revise those initial standards, the currently utilized principles and guidelines went into effect in March 1983. Since then, the national experience with flood disasters has identified the need to update federal policy and practice to reflect the many lessons learned and advancements in data, information and practice.

Section 2031 of the Water Resources Development Act of 2007 (WRDA 2007) called for revision to the 1983 Principles and Guidelines (P&G) for use in the formulation, evaluation and implementation of water resources and flood control projects. WRDA 2007 further required that revised principles and guidelines consider and address the following:

1. The use of best available economic principles and analytical techniques, including techniques in risk and uncertainty analysis.
2. The assessment and incorporation of public safety in the formulation of alternatives and recommended plans.
3. Assessment methods that reflect the value of projects for low-income communities and projects that use nonstructural approaches to water resources development and management.
4. The assessment and evaluation of the interaction of a project with other water resources projects and programs within a region or watershed.
5. The use of contemporary water resources paradigms, including integrated water resources management and adaptive management.
6. Evaluation methods that ensure that water resources projects are justified by public benefits.

In general, these requirements represented important goals for updating the P&G to respond to changes in the nation's values and increasingly looming concerns for our water resources nationally. In December 2014, the Obama Administration published an updated set of guidelines called the P*rinciples, Requirements and Guidelines*, which some federal agencies have implemented, but since the FY 2015 Consolidated Appropriations legislation, the Corps has been barred from implementing the revised P&G, or to make much in the way of needed changes in approaches or technical aspects of project planning. While Congress had some questions about the specific proposed revisions, we believe that an updating of project planning and evaluation procedures continues to be a strong current and future need to respond to present and changing priorities.

As an example, a major weakness of past benefit-cost analysis for water resources projects has been the failure of project planners to realistically account for the full life-cycle project costs over project lifetimes. This results in a bias for structural projects that require significant long-term O&M and rehabilitation costs, whereas nonstructural designs often have little or no maintenance, masking the true costs of alternatives.

- ASFPM recommends that in developing implementation guidance for the P&R, agencies must require a full accounting of long-term operations, maintenance, repair, rehabilitation and replacement costs be included in benefit-cost analyses for all structural and nonstructural projects, and identify which costs are a federal responsibility or the responsibility of non-federal sponsors or other interests.

The 1983 P&G require selection of water resources projects that maximize net National Economic Development (NED), regardless of total costs to taxpayers or the social or environmental impacts.

- ASFPM recommends that the Corps and other agencies develop and transition federal planning principles to a National Economic Resilience and Sustainability standard instead of the current National Economic Development standard to explicitly incorporate the values of multiple ecosystem services, including the non-market public values provided by the nation's floodplains and ecosystems.

Floodplain management, public safety and long-term environmental quality and sustainability would, in many instances, improve by expanding to a resilience/sustainability standard approach.

Another major concern with water resources projects is that they should be designed and analyzed on conditions that will exist at the end of their design life. For example, if a levee is designed for a 50-year life, the level of protection it will pro-

vide must be calculated using the hydrology (rainfall and runoff) and sea level rise that can be projected for the end of that design life. As extreme rainfalls increase and sea level rises, it is foolhardy to not use these future conditions in design and BCA analysis. We are currently seeing levees that no longer provide the design level of protection because design rainfalls have increased from 25–45%, thus the design flood height is much higher. In those cases, levee overtopping and failure result in excessive damage because development in the "protected area" now experiences flooding at great depths and damages. Nonstructural options like elevation of buildings or relocation would not experience that catastrophic damage. All such information needs to be factored in the BCA analysis

During the dozen years since WRDA 2007 was enacted, costly and disruptive floods have continued to plague nearly all parts of the nation, with the extended Midwest flooding this year, and with major Gulf Coast and Eastern Seaboard flooding, from 2017 and 2018 hurricanes providing the latest reminders of the extent of the nation's vulnerability. ASFPM believes that the nation can no longer afford to continue on its current path of authorizing and funding projects through a process that is so heavily biased toward structural approaches without comprehensive review of environmental impacts and consideration of nonstructural alternatives, and without fully leveraging state and local authorities in land use, infrastructure maintenance and building codes. While the 1983 P&G needs to be retired and replaced by a modern and updated P&G as soon as possible, we note also that in Section 2032 of WRDA 2007, Congress had called for a report on the nation's vulnerability to flooding, including risk of loss of life and property, and the comparative risks faced by different regions of the nation. The report was to include the following elements:

- An assessment of the extent to which programs in the U.S. relating to flooding address flood-risk reduction priorities;
- The extent to which those programs may be encouraging development and economic activity in flood-prone areas;
- Recommendations for improving those programs with respect to reducing and responding to flood risks; and
- Proposals for implementing the recommendations.

Unfortunately, while started, this study was never completed, yet the need for these analyses and recommendations in this area continues and is more urgent now than ever. We urge the Committee to redouble its efforts to bring forward these or similar initiatives into focus and move them to completion to help guide the nation forward to meet critical water resources and flood-related challenges ahead.

Federal policy initiatives such as the update of P&G and making investments through regular and supplemental appropriations that are underway could be informed by the findings and recommendations anticipated to emerge from this report. We urge Congress to insist on a timely completion and delivery of this report.

Again, thank you for the opportunity to share our observations with you. We hope you find them helpful in your oversight of the U.S. Army Corps of Engineers programs and direction and in consideration of the next Water Resources Development Act. If you have any questions, please contact ASFPM Executive Director Chad Berginnis.

Mrs. NAPOLITANO. Thank you very much, Mr. Berginnis.

Mr. Tom Waters, you are recognized.

Mr. WATERS. Thank you, Madam Chairman, members of the committee, and I want to include staff, too.

I appreciate this opportunity to provide testimony regarding the Water Resources Development Act and the Missouri River.

As chairman of the Missouri Levee and Drainage District Association, I represent levee and drainage districts, businesses, associations, and individuals interested in the activities and issues surrounding the Missouri River and its tributaries.

I am honored to have this opportunity to provide comments on behalf of the levee association's membership and fellow Missourians who have been impacted by this year's flooding.

I am a seventh-generation farmer. I produce corn, soybeans, and wheat in the highly productive bottomlands along the Missouri River. I know and understand the importance levees and flood con-

trol projects play in protecting lives and property in my community and communities across the Nation.

Now, I could read 17 pages of testimony, but I do not think you want me to do that, and I do not want to do that. So I would rather just make three points this afternoon.

First, the current Missouri River flooding is not over. The reservoirs in the Upper Basin in Montana and North Dakota and South Dakota are full. Reservoirs in Kansas have an abundance of water, and reservoirs in Missouri and the Osage Basin are full as well.

All three of these basins are going to flow water down the Missouri River, and it has got to get to St. Louis by the next spring. So that is going to keep the river high.

We know it is going to be high above flood stage probably through the rest of this summer, fall, and into winter, and with over 100 levees breached along the Missouri River, flooding is going to continue to be a problem.

It is going to take a long time to recover these levees, and it is going to take funding. I hope this committee and Congress will act quickly and decisively to push the Corps forward with funding and oversight so repairs could be made as soon as possible.

My second point, flood control needs to be the number one priority for the Missouri River Reservoir system. This was a once highly engineered system, but over the past 20 years, it has been used to conduct supersized science experiments for two birds and a fish.

These experiments have decimated the flood control system, dike notching, destroyed dikes, revetments, and other structures in the river. Open channels and chutes along the river have caused the river to flow differently than it used to.

Changes in storage levels, changes in how and why we release water, all have changed and taken away from flood control in the system. We have to get back to flood control as the top priority.

We have reached the tipping point, and we can no longer continue to conduct failed experiment after failed experiment at the expense of people's lives and livelihoods, and I said "lives" because people have died.

Missouri and Iowa farmland was not meant to be the U.S. Fish and Wildlife Service laboratory, and Midwestern farmers no longer want to be their guinea pigs.

It brings me to my third point, and that is that it is not just the Missouri River. Flood control infrastructure needs to be a national priority. Just like the highway system, the power grid, internet, and communications infrastructure, flood control infrastructure has been left behind.

Flooding takes place nearly every day in this country somewhere. Just look at your TV. Every morning you can see it is flooding somewhere, most recently, day before yesterday, here in Washington.

We spend billions of dollars in flood recovery, and in comparison, we spend very little on prevention, and we cannot build an umbrella over the coastlines to protect us from hurricanes, and we cannot bolt together the fault lines to protect us from the earthquakes.

But we can build flood control infrastructure. Floods do not discriminate. They do not choose Democrats over Republicans. They do not choose rich over poor, East over West, and North over South.

Flood control is not a partisan issue. It is an issue impacting the entire country, and as such, the entire Congress should support prioritizing flood control infrastructure as money for infrastructure projects is appropriated.

I thank you, and I ask that my written comments be included in the record, and I look forward to answering your questions.

[Mr. Waters' prepared statement follows:]

Prepared Statement of Tom Waters, Chairman, Missouri Levee and Drainage District Association

Chairman DeFazio and members of the United States House Committee on Transportation and Infrastructure:

Thank you for this opportunity to provide testimony regarding the Water Resources Development Act and the Missouri River. As chairman of the Missouri Levee and Drainage District Association, I represent levee and drainage districts, businesses, associations and individuals interested in the activities and issues surrounding the Missouri River and its tributaries. I understand the importance of this committee's work as it relates to flood control and the protection of human lives and property. I am honored to have this opportunity to provide comments on behalf of the levee association's membership and fellow Missourians who have been impacted by flooding this year.

I am a seventh generation Missouri farmer. My family farming operation produces corn, soybeans, and wheat in the highly productive bottomlands along the Missouri River. As president of three local levee and drainage districts, I know and understand the importance levees and flood control projects play in protecting the lives and property in my community and communities across our nation.

2019 has been a difficult year for people living and working along the Missouri River. The Missouri River system was overwhelmed by inflows well above any seen before. The U.S. Army Corps of Engineers has been tasked with managing record-breaking runoff into the Missouri River Flood Control System this year. The extraordinary runoff proved to be too much for the Army Engineers to handle and the result was major flooding from above Sioux City, Iowa to St. Louis, Missouri, along the River and several tributaries.

My testimony will center around three points. 1) Recent flooding and funding needs for levee repairs and flood recovery, 2) Desperately needed changes in the management and operations of the Missouri River Reservoir System, and 3) Long-term improvements to flood control infrastructure across the nation. In addition to these comments, I have attached an article, I wrote in April, about this year's flood and the Missouri River.

2019 MISSOURI RIVER FLOODING

The 2019 Missouri River Flood is not over. High flows on the Missouri River will continue well into summer as the U.S. Army Corps of Engineers continues to release water from the mainstem reservoir system in the Upper Missouri River Basin. In addition to the mainstem system, reservoirs in Kansas and in the Missouri Osage Basins have an over abundant supply of water, which will have to be released during the same time period. These releases will combine to keep Missouri River flows above flood stage at most locations. Any additional heavy rainfall will cause additional flooding.

The, now infamous, "Bomb Cyclone" hitting Nebraska and South Dakota early this spring brought snow and heavy rain which overwhelmed the Missouri River flood control system. The bomb cyclone was followed by a second round of heavy snow and rain later in the spring causing even more damage throughout the Missouri River Basin. Levees have been overtopped, breached and eroded by the high-water event. Communities have been inundated, homes and businesses lost and in rural areas, farmers have lost not only their homes, but also their 2018 crops stored in flooded bins, their machinery and their livestock. Hopes for planting a crop this year have dwindled away as the river continues to scour across flooded fields.

Flooding in the Midwest impacts the entire country. The Missouri Department of Transportation closed more than 470 different routes in 114 counties from April 29 to June 14. Many remained closed today. Railroad tracks were washed out and train traffic was stopped and disrupted by delays and re-routing. Flooding hindered the movement of products through the states of Missouri, Iowa, Nebraska and Kansas with impacts across the entire nation. Barge traffic on the Missouri River was also disrupted.

The flood control system of levees, which has been weakened by years of lack of improvement, has been decimated. The following is a list of levees overtopped or breached in the Kansas City, Omaha and St. Louis Corps of Engineer Districts:

KANSAS CITY DISTRICT LEVEE STATUS

FEDERAL LEVEES OVERTOPPED

March Event Overtoppings

MRLS 500-R (KS) Iowa Point Drainage District No. 4 (First Federal Levee to overtop since 1993) Doniphan, KS March 21

FEDERAL LEVEES THAT HAVE BREACHED:

MRLS 246-L Brunswick-Dalton Levee District, Chariton County, May 31

NON-FEDERAL LEVEES THAT HAVE BREACHED:

March Event Breaches

Union Township Levee (MO), Holt County, March 16
Holt County 10 Levee (MO), Holt County, March 16
Holt County 9 Levee (MO), Holt County, March 18
Rushville-Sugar Lake Levee, Platte County, March 21
Platte County #1 Section #1 Tie-Back Levee

Platte County #1 Section #2 Tie-Back Levee
Walcott Drainage District #1 Levee, Wyandotte County, KS, March 23
Corning Levee, Holt County, March 16

Recent Breaches

Brunswick Levee. Carroll County, May 23
DeWitt Levee, Carroll County, May 23
Mi-De Levee, Carroll County, May 23
Labadie Section #4 Levee (Intentional), Franklin County, May 22
Cambridge Levee, Saline County, May 23
Lower Morrison Bottom Levee, Gasconade County, May 28
Prison Farm Levee, Cole County, May 28
Northeastern Saline Levee,
Saline County Levee, May 28
Saline County #2 Levee, Saline County, May 28
Garden of Eden #1 Levee, Chariton County, May 30
Garden of Eden #2 Levee, Chariton County Levee, May 30
Garden of Eden #3 Levee, Chariton County May 31
West Glasgow Levee, Saline County, May 30
Tri-County Drainage District Levee (Ray, Clay, Jackson Counties) Ray County, June 1
Belcher Lozier Levee
Reveaux Levee, Callaway County, June 1
Sugartree Bottom Levee (Intentional), Carroll County, June 1
Howard County #4 Levee, Howard County June 1
Howard County #7 Levee, Howard County, June 4
Levasy Levee (Not in PL84-99 Program) June 1
Cooper County #1 Levee, Osage County, May 30
Bonne Femme Levee, Howard County June 1
Ray-Carroll Levee, Ray/Carroll Counties May 31
Renz Levee, Callaway County, June 7
Capitol View Levee, Callaway County, June 7

NON-FEDERAL LEVEES THAT HAVE OVERTOPPED

March Event Overtoppings

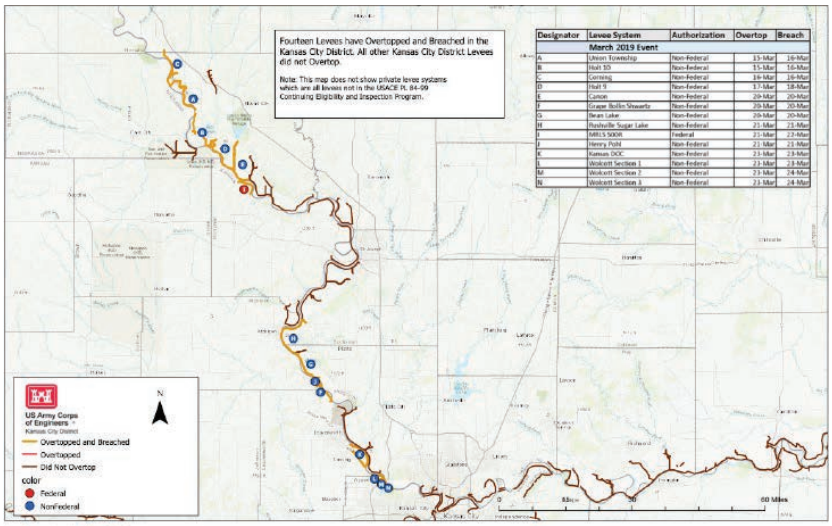
Canon Levee (MO), Holt County, March 20
Grape-Bollin-Schwartz Levee (KS), Leavenworth/Atchison Counties, KS, March 20
Bean Lake Levee (MO), Platte County, March 20
Henry Pohl Levee (KS), Atchison County, KS, March 21
Kansas Department of Corrections Levee, Leavenworth County, KS, March 23
Walcott Drainage District #2 Levee, Wyandotte County, KS, March 23
Walcott Drainage District #3 Levee, Wyandotte County, KS, March 23

Recent Overtoppings

Ray-Carroll Levee Overtopping Stopped with flood fight and intact
Howard Bend #3 Levee, Section 1
Cooper County #1 Levee
Howard County #6 Levee, Howard County, May 23
Howard County #3 Levee, Section 2, Howard County, May 31
Howard County #3 Levee, Section 1, Howard County, May 23
Howard County #2 Levee, Howard County, May 31
Chamois #1 Levee
Chamois #2 Levee, Osage County, May 24
Chamois A-1 Levee
Diermann Levee, Gasconade County, May 24
Jacobs Levee, Callaway County, May 24
Tebbetts East Levee, Callaway County, May 24
Tuque Creek Levee, Warren County, May 25
McBaine Levee, Boone County, May 27
Big Bend Levee, Carroll County, May 29
Whitman Levee, Chariton, May 29
Wainwright Levee, Callaway County, June 1
Malta Bend Levee, Saline County June 1
Henrietta-Crooked River Levee, Ray County June 1
Plowboy Levee, Moniteau County, May 24
Linneman-Weekly Levee, Cooper County, May 23
Egypt Levee
Hartsburg #1 Levee

Hartsburg Levee #2 Levee
Hartsburg #3 Levee, Boone County May 31
Mokane Levee
Steedman Levee
Holtmeier Levee Association

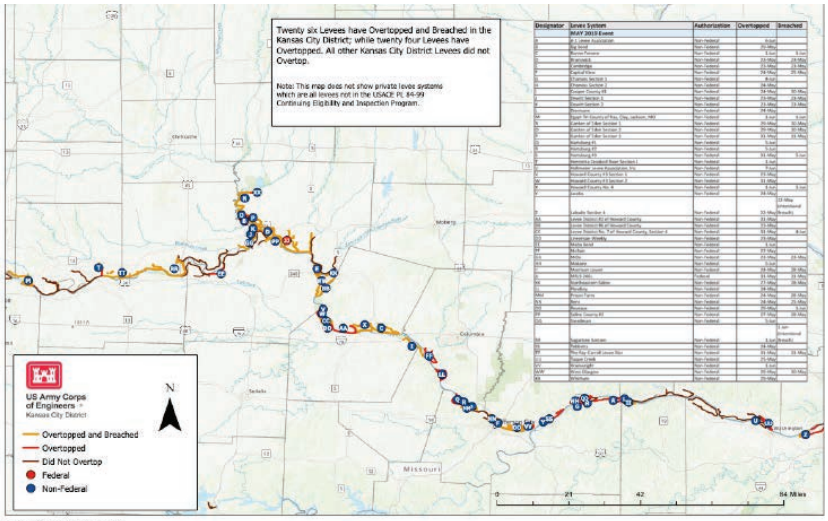
2019 MISSOURI RIVER FLOOD—MARCH & APRIL OVERTOPPED AND BREACHED LEVEES



Designator	Levee System	Authorization	Overtop	Breach
	March 2019 Event			
A	Union Township	Non-Federal	13-Mar	16-Mar
B	Hall 10	Non-Federal	15-Mar	16-Mar
C	Corning	Non-Federal	16-Mar	16-Mar
D	Hall 9	Non-Federal	17-Mar	18-Mar
E	Canton	Non-Federal	20-Mar	20-Mar
F	Grange Bolin/Shwartz	Non-Federal	20-Mar	20-Mar
G	Bean Lake	Non-Federal	20-Mar	20-Mar
H	Rushville Sugar Lake	Non-Federal	21-Mar	21-Mar
I	MILLS NOOK	Federal	21-Mar	22-Mar
J	Henry Pohl	Non-Federal	21-Mar	21-Mar
K	Kansas DOC	Non-Federal	23-Mar	23-Mar
L	Wolcott Section 1	Non-Federal	23-Mar	23-Mar
M	Wolcott Section 2	Non-Federal	23-Mar	24-Mar
N	Wolcott Section 3	Non-Federal	23-Mar	24-Mar

Map Current as of 22 May 2019.

2019 MISSOURI RIVER FLOOD—MAY & JUNE OVERTOPPED AND BREACHED LEVEES



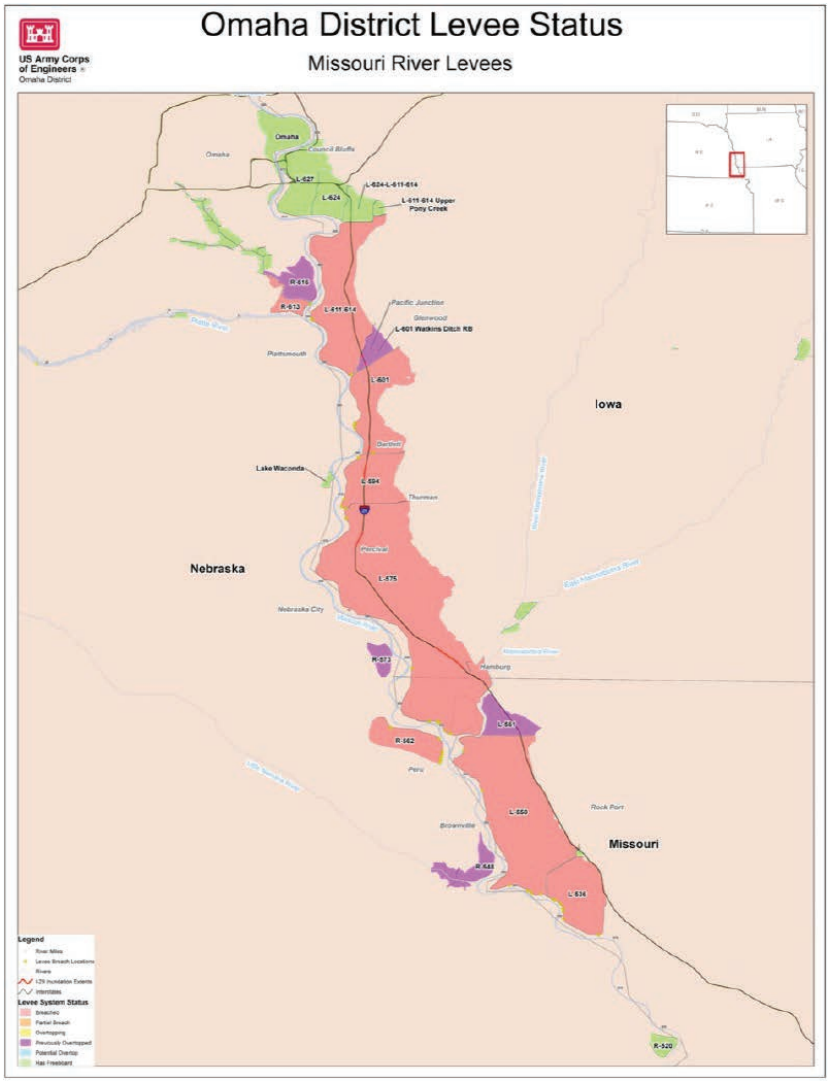
Designator	Levee System	Authorization	Overtopped	Breached
	MAY 2019 Event			
B	A.J. Lewis Association	Non-Federal	3-Jun	
C	Big Bend	Non-Federal	30-May	
D	Boone Prairie	Non-Federal	3-Jun	3-Jun
E	Cambridge	Non-Federal	23-May	24-May
F	Cambridge	Non-Federal	23-May	23-May
G	Capital Pike	Non-Federal	24-May	25-May
H	Chariton Section 1	Non-Federal	8-Jun	
I	Chariton Section 2	Non-Federal	26-May	
J	Cooper County #8	Non-Federal	24-May	30-May
K	Dowell Section 1	Non-Federal	23-May	24-May
L	Dowell Section 2	Non-Federal	23-May	24-May
M	Dunnegan	Non-Federal	24-May	
N	Expel Tri-County (Ray, Carroll, Hill)	Non-Federal	8-Jun	8-Jun
O	Garden of Eden Section 1	Non-Federal	30-May	30-May
P	Garden of Eden Section 2	Non-Federal	30-May	30-May
Q	Garden of Eden Section 3	Non-Federal	31-May	31-May
R	Hartsburg #1	Non-Federal	3-Jun	
S	Hartsburg #2	Non-Federal	3-Jun	
T	Hartsburg #3	Non-Federal	31-May	3-Jun
U	Holtmeier Steedman Section 1	Non-Federal	8-Jun	
V	Holtmeier Levee Association, Inc.	Non-Federal	8-Jun	
W	Howard County #3 Section 1	Non-Federal	31-May	
X	Howard County #3 Section 2	Non-Federal	31-May	
Y	Howard County No. 4	Non-Federal	8-Jun	8-Jun
Z	Jacobs	Non-Federal	28-May	
			28 May (intentional breaches)	
AA	Labadie Section 1	Non-Federal	30-May (breaches)	
AB	Lewis District of Howard County	Non-Federal	31-May	
AC	Lewis District No. Two Howard County	Non-Federal	31-May	
AD	Lewis District No. Two Howard County Section 2	Non-Federal	31-May	8-Jun
AE	Lewisville Weekly	Non-Federal	23-May	
AF	Mills Nook	Non-Federal	3-Jun	
AG	Mokane	Non-Federal	27-May	
AH	Nelson	Non-Federal	23-May	25-May
AI	Nelson	Non-Federal	3-Jun	
AJ	Nelson Island	Non-Federal	24-May	30-May
AK	Nelson Mills	Federal	31-May	31-May
AL	Northeastern Saline	Non-Federal	23-May	26-May
AM	Pendleton	Non-Federal	28-May	
AN	Prairie Farm	Non-Federal	24-May	30-May
AO	Ross	Non-Federal	28-May	25-May
AP	Rousseau	Non-Federal	30-May	3-Jun
AQ	Saline County #8	Non-Federal	27-May	30-May
AR	Steedman	Non-Federal	3-Jun	
			3-Jun (intentional breaches)	
AS	Tuggerson Island	Non-Federal	3-Jun (breach)	
AT	Valkenburg	Non-Federal	24-May	
AU	Wet Bay Carroll Lower Slur	Non-Federal	23-May	31-May
AV	Wagner Creek	Non-Federal	23-May	
AW	Wolcott#3	Non-Federal	3-Jun	
AXW	Wren Glasgow	Non-Federal	30-May	30-May
AX	Wrightsville	Non-Federal	28-May	

Map Current as of 12 June 2019.

Omaha District Levee Status

Levee System Status as of May 31, 2019

Reference Location	River	Levee System	Last Update	PL84-99 Program Participation	Previously Overtopped	# of Breaches	Initial Breach Repaired
Council Bluffs, IA	Missouri	L611-614	05/31/19	Federal	x	3	
Glenwood, IA	Missouri	L601	05/31/19	Federal	x	4	
Glenwood, IA	Watkins Ditch	L601-Watkins Ditch RB	04/04/19	Federal	x		
Fremont County, IA	Missouri	L594	05/31/19	Federal	x	5	
Hamburg, IA	Missouri	L575	05/31/19	Federal	x	7	
Hamburg, IA	Nishnabotna	L561	04/04/19	Federal	x		
Atchinson County, MO	Missouri	L550	05/20/19	Federal	x	7	
Atchinson County, MO	Missouri	L536	04/04/19	Federal	x	7	
Sarpy County, NE	Missouri	R616-613		Federal	x		1
Sarpy County, NE	Missouri	R616	04/04/19	Federal	x		
Sarpy County, NE	Missouri	R613	04/04/19	Federal	x	1	
Otoe County, NE	Missouri	R573	04/04/19	Federal	x		
Nemaha County, NE	Missouri	R562	04/04/19	Federal	x	10	
Brownville, MO	Missouri	R548	04/04/19	Federal	x		
Rulo, NE	Missouri	R520	04/04/19	Federal			
Sarpy County, NE	Platte	Western Sarpy	04/04/19	Federal	x		
Clear Creek, NE	Platte	Clear Creek	04/16/19	Federal	x	4	2
Valley, NE	Platte	Union Dike	04/16/19	Non-Federal	x	1	1
Ames, NE	Platte	Ames Diking	04/04/19	Non-Federal	x	1	
Louisville, NE	Platte	YMCA Camp Kitaki	04/04/19	Non-Federal	x		
Cass County, NE	Missouri	Lake Wa Con-Da	04/04/19	Non-Federal	Boils		



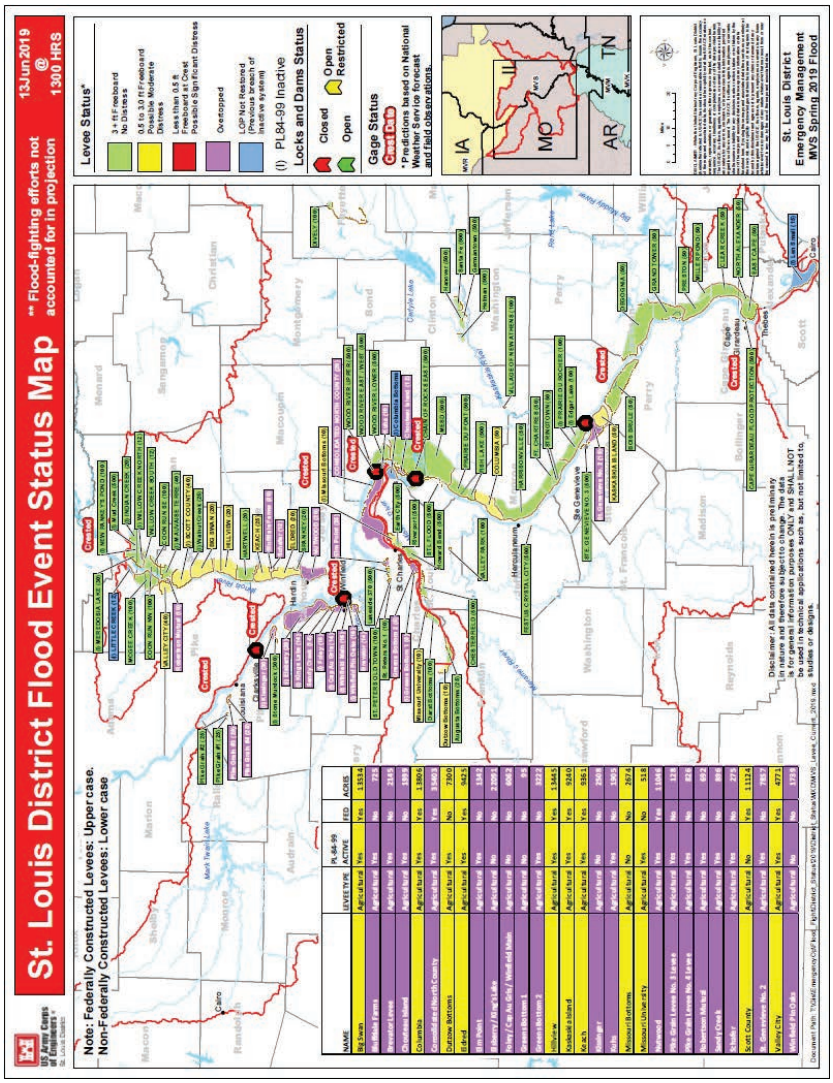
ST. LOUIS DISTRICT LEVEE STATUS—MISSISSIPPI RIVER

Breaches

Brevator Levee
Winfield Main Levee
Pike Grain #3 Levee (Intentional)
Pike Grain #4 Levee
Kissinger Levee
Elsberry Levee
Chouteau Island Levee
Elm Point Levee
Kuhs Levee
Ste. Genevieve #2 Levee (Intentional)
Winfield Pin Oaks Levee
Nutwood Levee

Overtoppings

Foley Levee
King's Lake Levee
Sandy Creek Levee
Consolidated North County Levee
Greens Bottom #1 Levee
Greens Bottom #2 Levee
Bluffdale Farms Levee
Robertson Mutual Levee
Keach Levee
Hillview Levee
Schaefer Levee
Eldred Levee



LEVEE REPAIRS AND RECOVERY

The Kansas City District Corps of Engineers Emergency Management office estimates recovery and levee rehabilitation from this year's flood event will be the largest rehabilitation program in their district since the great flood of 1993. They expect to receive between 80 and 90 requests for assistance from levee sponsors. Many of these have already been received and more requests continue to come into the office as levee sponsors assess damages. Damage will range from loss of grass cover from top and side wash to eroded levees and full-blown breaches with some systems having multiple breaches.

USDA is also assessing damages and planning for many requests for assistance recovering land damaged by the fast and destructive river flows. Assistance for damaged fields, flooded grain bins, lost crops and lost livestock will all be a part of the USDA programs to help farmers damaged by the flooding. But none of it will be enough to cover all the loss and suffering many farmers are facing. Crop insurance never covers all the farmer's losses and USDA assistance usually comes with some sort of cost-share farmers can find hard to match. The agricultural economy has been struggling and during some of the worse times for agriculture in recent years, this devastating flood will cause some farmers to lose their business. In some cases, farms handed down for generations will be lost.

Congress must act quickly to fund levee repairs. The recovery from the most recent flood events prior to this year has been slow and painful. Some levees along the Missouri River still had not been fully repaired from flooding in 2015, when this year's flood hit. In some cases, it has taken 3–4 years to complete the levee rehabilitation process. The recovery from this year's event must be handled better.

At this time, it is difficult to assess flood damage. The continuing high flows from upper basin reservoirs are preventing Corps of Engineers teams from completing damage assessments. It will take time for these teams to be able to do their work and have a good idea of the expenses related to the levee repairs. Once this work is completed, levee sponsors will need Congress to act quickly to make funding available for the repairs. Communities, business, property owners and the states economies all depend on levee protection and they are depending on Congress to act quickly with enough funding to meet their needs.

The number one industry in Missouri is Agriculture. With one-third of the grain produced in Missouri coming from the 100-year floodplain, the state's economy is directly impacted by flooding and by levee breaches left unrepaired. The flow required to flood this highly productive land is much less when levees are left unrepaired. Levee sponsors rely on Congress to provide the U.S. Army Corps of Engineers the needed funding for levee repairs.

Delays in funding for repairs hamper an already slow and cumbersome process. I fear additional flooding and losses as we wait for levees to be repaired along the lower Missouri River. I hope this committee and all members of Congress will act quickly and decisively to push the Corps forward with funding and oversight to see the repairs are made as soon as possible.

MISSOURI RIVER RESERVOIR OPERATIONS

The Missouri River Flood Control System has been hijacked and it is no longer being used to provide flood control as it was designed. For over 20 years, the Corps of Engineers has been forced by the U.S. Fish and Wildlife Service to manage the system to conduct super-sized science experiments for two birds and one fish. The threatened and endangered interior least tern, piping plover and pallid sturgeon. These failed experiments have included: changing system storage amounts and how water is released, notching dikes, revetments and other structures in the river, opening chutes and channels along the river, and even causing intentional flooding. The experiments have weakened the system's ability to provide flood control and the result has been flooding of greater magnitude and frequency.

Flood control must be the number one priority for the management and operation of the Missouri River Reservoir System. We have reached a tipping point and we can no longer continue to conduct failed experiment after failed experiment at the expense of people's lives and livelihoods. Missouri and Iowa farmland was not meant to be the U.S. Fish and Wildlife Service's laboratory and midwestern farmers no longer want to be their guinea pigs.

After changes in the Missouri River Master Water Control Manual in 2004, the Corps has been trying to manage and operate the system equally for all eight authorized uses for the system. The simple fact is all uses are not equal and the system cannot be managed to make them equal. The system was built and designed to provide flood control. Like anything else, when one uses something for a purpose it was not designed for, more often than not it fails. This is true with the Missouri River Reservoir System. You cannot put a gallon of water in a quart jar and you cannot dismantle the system of dikes and structures, open chutes to send water out of the channel, misallocate stored water, conduct experiments for fish and birds, and expect to provide flood control. The system must be used the way it was designed. It must be used for flood control. We have seen what happens when flood control is not the top priority for the system. Lives have been ruined, businesses lost, and people have died.

NEED FOR FLOOD CONTROL INFRASTRUCTURE IMPROVEMENTS

The decline of our flood control infrastructure is not limited to the Missouri River. The lack of emphasis on flood control over the past 20-plus years and the current inadequate infrastructure must be addressed as a national priority. Congress must act together to correct the problem.

Flooding occurs nearly every day somewhere in the United States. In his testimony during a recent U.S. Senate Committee on Environment and Public Works

field hearing, Major General Scott A. Spellmon, Deputy Commanding General for Civil and Emergency Operations, United States Army Corps of Engineers, opened his remarks with a brief review of the many places across the country impacted by flooding this year. He said, "*At one point, over 300 river gauges indicated a flood stage somewhere in the Nation, and there were over 183 reported ice jams on rivers across the northern portion of the country.*" He went on to describe flooding occurring in Ohio, the Vicksburg Corps District, the Corps' Memphis District, North Dakota, Colorado, California, Oregon and of course along much of the Missouri River.

The long list of flooding locations serves to remind us the lack of attention to flood control infrastructure over the past several years is a national problem, which impacts nearly every corner of the country. Floods do not discriminate. They do not choose democrats over republicans or vice versa. Floods don't choose rich over poor, north over south or east over west. Flood control is not a partisan issue. It is an issue impacting the entire country and as such, the entire Congress should support prioritizing flood control infrastructure as money for infrastructure projects is appropriated.

In conclusion, this committee needs to remain aware of the ongoing flooding along the Missouri River. The flood is not over and the people of the Midwest and the River itself will need your leadership, guidance and support to recover from this devastating disaster.

Flood control must be the number one priority for the operation and management of the Missouri River. Using the system for fish and bird experiments has degraded the effectiveness of the flood control system and costs our country billions of dollars.

There is a nationwide need for improvements to the country's flood control infrastructure. Improvements need to start here and now with this committee and with Congress. The failure to address the need for flood control infrastructure will lead to more flooding of greater magnitude and frequency.

Without flood control transportation and commerce are interrupted, sewer and water supply are put at risk, and some of the nation's best farmland is left out of production. Without flood control people's lives are put at risk and yes, people die. Simply put, without flood control, nothing else matters.

Thank you for this opportunity to provide comments to your committee. I look forward to working with each of you to help reduce flooding across the nation and provide better protection to the American people.

ATTACHMENT

FLOODING: WHERE WE ARE, WHERE WE'VE BEEN AND WHERE WE NEED TO GO

By Tom Waters
April, 2019

The flood of 2019, wreaked havoc in Missouri, Iowa, Kansas and Nebraska. From Omaha to Kansas City over 100 breaches in levees allowed the Missouri River to spread across some of the nation's most productive farmland and through Missouri and Iowa communities. In each case, levees preformed as designed. However, the volume and velocity of the River exceeded the design of the flood control system.

Heavy snow and rain running into the River caused it to rise to record levels. Most of the runoff entered the River below Fort Randall Dam. Water running into Lewis and Clark Lake (Gavins Point Dam) had to be released through the dam, because the Lewis and Clark Reservoir has little to no storage available. It is a regulation dam, which means what comes into the lake must be released. Compounding the excessive rain and snow event was a breach of the Spencer Dam on the Niobrara River in Nebraska, allowing even more water to run into Lewis and Clark Lake. The system was overwhelmed and could not handle the amount of water being released by reservoir operators working for the US Army Corps of Engineers.

The Bomb Cyclone which brought heavy snow and rain happened quickly and did not allow time for thousands of citizens to move grain, equipment, property and belongings out of harm's way. The result is millions of bushels of grain loss, homes destroyed, livestock losses and lives ruined. One farmer I talked to loss his home, his machinery, and over half his 2018 crop, which was stored in grain bins. He will not be able to plant a crop in 2019, and doubts his bank will loan him money to recover and continue to farm in the future. This 5th generation farmer is only one example of thousands suffering from the lack of flood protection needed to prevent Missouri River flooding.

For decades, the federal government has focused Missouri River Operations on fish and wildlife. The U.S. Fish and Wildlife Service has used the Endangered Spe-

cies Act as a huge hammer to force the U.S. Army Corps of Engineers to change the way the flood control system is operated on the Missouri River, resulting in an incapacitated flood control system. The Missouri River is a highly engineered river. In the upper basin, above Yankton, South Dakota, the world's largest system of dams and reservoirs were built to capture snow melt and spring runoff. Below Yankton, levees and smaller lakes and reservoirs provide flood protection as water is released from the system above. Sadly, the system, as originally designed, was never finished and the Pick-Sloan Plan for the Missouri River never reached its intended potential.

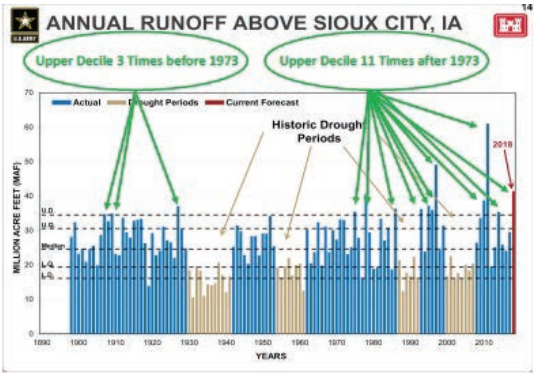
The system was originally built for flood control. Along with flood control, engineers designed the lower river to provide navigation to move products up and down the river. For decades, the flood control and navigation system brought great economic benefits to the Missouri River Basin. These two primary purposes also allowed for other benefits to develop such as water supply, hydropower, irrigation, water quality control, and recreation, which includes fish and wildlife.

In 1973, things began to change. With the passage of the Endangered Species Act the Corps of Engineers began changing structures in the river, which were designed to provide for a 300′ wide and 9′ deep channel. The Corps began notching dikes, revetments and other structures designed to control the flow of the river and provide flood control and navigation in the lower river. The notching continues today, 46 years later. Other changes have taken place over the years. Drought periods impacted the recreation industry in the upper basin and upper basin states began to push for changes in the way reservoir levels were managed. This kicked off a period of great contention between upper and lower basin states.

As calls for changes in the Missouri River Master Water Control Manual, were made by upper basin states, some environmental groups saw an opportunity to takeover the management of the River. They pressed the U.S. Fish and Wildlife Service to get involved. Three threatened and endangered species were identified and the power of the endangered species act would soon cause a dramatic shift in the way the U.S. Army Corps of Engineers operated the system. Instead of using the highly engineered system for flood control and navigation as originally designed, the Corps of Engineers found itself dismantling the system piece by piece through increased dike notching and conducting experiments for the Fish and Wildlife Service. These experiments are designed to "connect the river to the floodplain" or in more understandable terms "designed to cause flooding along the Missouri River"!

Failed experiment after failed experiment over the past 20-plus years has substantially changed the previously highly engineered river. Structures which once provided a stable channel have been weakened, and in some cases removed. Side channels and chutes have been opened to allow the River to flow uncontrolled and cause erosion and scouring. Flood control has been diminished and riverboat pilots find it hard to navigate the channel, which has become dangerous at many locations. A system once used to provide flood control is now being use as a super-sized science experiment for two birds and a fish. As a result, we are seeing greater floods more often, human lives have been lost and people are enduring great suffering. All the while, no scientific evidence can be found to show any of the changes have even helped the fish and two birds!

The U.S. Army Corps of Engineers has spent over 2/3 of a Billion Dollars making changes to the River since 2005, in the name of Missouri River Fish and Wildlife Recovery. Meanwhile, we continue to see more water entering the River at higher velocities. Note the Graph below from the Corps of Engineers:



Prior to 1973, the runoff above Sioux City reached the upper decile level only three time, while since 1973, runoff has been in the upper decile 11 times. Clearly, more water is coming into the system, more often.

Changes must be made! The flood of 2019, can more accurately be describe as the flood of 1973 through 2019. Dike notching began in 1973, the first of many changes to the original river design. In 2004, congress approved changes to the Missouri River Master Water Control Manual which no longer held flood control as the primary purpose for the flood control system. Instead, the Corps is forced to try to balance all the purposes of the system to the determent of their ability to provide flood protection.

When one uses something in a way it was not designed to be used it often fails. When hooking a tractor to a plow too large for the tractor, the tractor may pull it for a short time, but eventually the tractor will give out and likely ruin the engine. Trying to put a gallon of water into a quart jar only causes a mess on the table top. Likewise, using the flood control system for science experiments is failing and making a mess of the Missouri River Basin.

Many want to blame the Corps of Engineers for the recent flooding and floods of the past. After all, the Corps operates the flood control system. Right? While it is true the Corps operates the system, we will do well to remember the Corps of Engineers is the United States Army Corps of Engineers. These solider engineers follow orders and those who follow orders best rise to the top of the Corps. Colonels do what Generals order them to do and Generals do what the Generals above them order them to do. We must understand where the orders to conduct science experiments with the Missouri River flood control system came from.

Ultimately, the Corps of Engineers' orders come from Congress. Congress needs to change the orders! Pressure from well-funded environmental groups, over the years, has caused Congress to blindly make changes in the way the Missouri River system is operated and removed flood control as the system's top priority.

Flood Control MUST be the top priority for the operation of the Missouri River flood control system. Flood control was the original purpose for building the system back in 1944. Flood control is even more necessary today than it was in 1944. Inflows into the system are greater and the system has not been improved to meet the challenges of higher flows and greater velocities. The system has been modified to reduce flood control rather than improve flood control. The tipping point has been reached and people have suffered enough!

By making flood control again the top priority for the management of the system, infrastructure improvements can be made and flooding can be reduced—even eliminated. We cannot build an umbrella over the coastlines to protect people from hurricanes and we cannot bolt together the fault lines to protect people from earthquakes, but we can build flood control infrastructure to protect people and property from flooding. They do it in Holland and China, and we can do it here in the United States. The key is for Congress to make flood control the priority.

Making flood control the top priority for management of the Missouri River should be easy for Congress to do. Following flood after flood along the Missouri River congress has spent millions upon millions of dollars for recovery. Congress needs to spend money up front to prevent the damages in the first place. Improving infrastructure now can reduce or eliminate the expense of recovery later.

Some will say let's just move everyone and everything out of the floodplain and allow the river to run wild. These uneducated scholars do not understand the eco-

nomic value of the farmland found in the nation's bottomlands. In Missouri alone, over one third of the crop production is located in the fertile river valleys. The highly productive soil found adjacent to the nation's rivers makes our country strong. A hundred thousand acres of river bottomland can produce enough calories to feed over 1 Million people for an entire year. What a waste it would be to allow rivers to run wild and destroy such a valuable part of our nation's strength.

Food production makes the United States strong. When we want to put pressure on other countries, we use food to encourage them to do the right thing. When we want to help other countries, we send them food. Food is the strength and leverage we have many other countries only wish they had. Protecting our food production in turn protects all Americans. Sure, the United States has the strongest military in the world, but as a peaceful nation, food is the most powerful tool we can use before turning to the use of bullets.

Following the 1993, and 2011, floods on the Missouri River, the greatest recovery expenses were related to agriculture. It only makes sense to protect the rich farmland along the River. To do this, flood control must be the top priority and the ludicrous practice of "connecting the river to the floodplain" must stop. Levees and other flood control infrastructure must be improved and the system must be managed to provide the protection it was designed to provide.

It took a long time to tear down the once highly designed system and it will take time to bring it back to the level of protection it once provided. But with Congress designating flood control as the top priority, these changes can begin. At the same time, fish and birds can survive, a safe water supply can continue, barges can ply the river and the other uses can flourish. Making flood control the top priority does not mean an end to all other uses and purposes for the River. It simply means the U.S. Army Corps of Engineers will use the system as originally designed to protect human lives and property.

Meanwhile, the flooding for this year is likely not over. The system is primed for more flooding and the Missouri River could reach even higher levels at some locations than we saw earlier this year. A second storm in the plains of the upper basin dumped more rain and snow, all of which must eventually move through the system. The Corps of Engineers will have to increase releases to move water from the upper basin reservoirs. In addition, The Corps will need to begin making releases from reservoirs in Kansas which have been holding water back to aid with flooding downstream of Kansas City. The combination of releases from Kansas and the Upper Basin will keep the river high through the spring and summer. Heavy rains anywhere along the river will likely cause additional flooding this year. With over 100 levees already breached and communities and property left unprotected, the combination of reservoir releases and heavy rainfall this spring or summer could bring even more heartache and devastation to the Missouri River Basin. This, as recovery begins and the people along the Missouri River seek help to put their lives and livelihoods back together.

The Congressional Delegations in the Midwest cannot do it by themselves. It will take the entire Congress to understand and fix the problem. The decline of our flood control infrastructure is not limited to the Missouri River. Flooding occurs nearly every day somewhere in the United States. In his testimony during a recent U.S. Senate Committee on Environment and Public Works field hearing, Major General Scott A. Spellmon, Deputy Commanding General for Civil and Emergency Operations, United States Army Corps of Engineers, opened his remarks with a brief review of the many places across the country impacted by flooding this year. He said, "At one point, over 300 river gauges indicated a flood stage somewhere in the Nation, and there were over 183 reported ice jams on rivers across the northern portion of the country." He went on to describe flooding occurring in Ohio, the Vicksburg Corps District, the Corps' Memphis District, North Dakota, Colorado, California, Oregon and of course along much of the Missouri River. The long list of flooding locations serves to remind us the lack of attention to flood control infrastructure over the past several years is a national problem, which impacts nearly every corner of the country.

The lack of emphasis on flood control over the past 20-plus years and the current inadequate infrastructure must be addressed as a national priority. Congress must act together to correct the problem. Floods do not discriminate. They do not choose democrats over republicans or vice versa. Floods don't choose rich over poor, north over south or east over west. Flood Control is not a partisan issue. It is an issue impacting the entire country and as such, the entire Congress should support prioritizing flood control first. Without flood control, nothing else matters.

Tom Waters is a seventh-generation farmer and Chairman of the Missouri Levee and Drainage District Association. He operates his family farming business in the Missouri River bottoms East of Kansas City, Missouri.

Mrs. NAPOLITANO. Thank you very much, Mr. Waters.

Now the Chair recognizes Ms. Julie Hill-Gabriel.

Ms. HILL-GABRIEL. Chairwoman Napolitano, Ranking Member Westerman, and members of the subcommittee, thank you for the opportunity to be here today.

I am Julie Hill-Gabriel, the vice president for water conservation at the National Audubon Society, and on behalf of our more than 1 million members, 23 State offices, and over 400 independent local chapters, Audubon's mission is to protect birds and the places they need for today and tomorrow.

Just like people, birds need water, and because of that, Audubon has made water conservation a core part of our conservation strategy. We work in places that are globally significant for birds and people, like the Colorado River and network of saline lakes in the arid West, the Great Lakes and the Mississippi River and its delta, the gulf coast, the Delaware River, the Everglades, and the Platte River, among many other places.

And aquatic ecosystems are really the liquid heart of America's environment. They provide drinking water for hundreds of millions of people while also showing innumerable benefits for wildlife and our Nation's economy.

As we discuss implementation of past Water Resources Development Acts and look ahead to future legislation regarding water infrastructure, it is critical to prioritize the investments in the aquatic ecosystem mission of the U.S. Army Corps of Engineers.

One international model of success for ecosystem restoration can be found in America's Everglades. It truly is the nonpartisan issue in the State of Florida where you have local, State, and Federal decision makers all acknowledging the benefits of restoration efforts not only for the wildlife that made the Everglades famous, but for addressing issues like the toxic blue-green algae blooms, red tide, and seagrass die-outs that have plagued Florida's coast in recent years.

And the economic consequences of these environmental catastrophes have truly demonstrated the inextricable link between the environment and the economy, and Everglades projects are estimated to produce a four-to-one return on investment.

Now, equally important are projects like those along the coast of Louisiana and the Mississippi River Delta where Audubon has owned and managed over 26,000 acres for almost a century.

A recent study by Audubon and our partners show that the coast of Louisiana is one of the most important places in the world for wildlife habitat, some species having 50 percent of their population using the coast for nesting and breeding habitat.

The restoration and protection of the Mississippi River Delta is often advanced with WRDA legislation and is essential to keeping this important ecosystem from collapse.

Now, the recent success and momentum of ecosystem restoration efforts can largely be credited to the work of this committee, getting us back on track. Passing WRDA bills every other year has en-

abled us to see significant progress and see some of these ecosystem projects now become a reality.

In addition to advancing critical ecosystem restoration projects, provisions in WRDA 2016 and 2018 present important opportunities to incorporate the use of more resilient natural infrastructure options, to reduce the impacts of storms, flooding or coastal erosion, and to promote reliable water supply.

These can include nature-based options, like restoring sand dunes, wetlands, oyster reefs, and coastal forests, and they can be used in place of or alongside traditional infrastructure, like seawalls, jetties, and levees.

In 2018, Audubon released a natural infrastructure report that highlighted the benefits of a number of projects from sediment diversions in Louisiana to living shorelines in California and North Carolina, to restoring breakwater oyster reef habitat in Florida, and all of these showed the significant benefits of this type of infrastructure.

When looking for options to reduce the impact of storms, the National Oceanic and Atmospheric Administration has found that across the U.S. coastal wetlands are estimated to provide more than $23 billion in storm protection services every year, and in watersheds that contain 15 percent wetlands, peak floods can be reduced by up to 60 percent.

Despite the clear statutory language in recent WRDA bills directing the Army Corps to consider natural infrastructure alternatives, very few of these measures are being implemented.

More effort is needed to ensure that the Army Corps can capture the multiple benefits provided by these measures and to require the Corps to conduct a full evaluation of a natural infrastructure alternative in each study addressing flood and storm damage reduction.

Audubon stands ready to work with the Army Corps and the subcommittee and other partners to find innovative and efficient ways to advance water infrastructure and help protect birds and the places they need.

Thank you for allowing me to be here today because we truly believe that where birds thrive people prosper.

[Ms. Hill-Gabriel's prepared statement follows:]

Prepared Statement of Julie Hill-Gabriel, Vice President for Water Conservation, National Audubon Society

Chair Napolitano, Ranking Member Westerman, and Members of the Subcommittee, thank you for the opportunity to be present here today, representing the National Audubon Society (Audubon), to discuss the status and future needs of Water Resources Development Acts. Audubon's mission is to protect birds and the places they need, today, and tomorrow. Audubon represents more than one million members and has 462 affiliated chapters, 22 state offices, and 41 nature centers across the country.

My name is Julie Hill-Gabriel, and I am Audubon's Vice President for Water Conservation, based in Washington, DC. I coordinate Audubon's water strategy across the United States. Before beginning this new role in 2018, I worked in Florida for 11 years as Audubon Florida's Deputy Director for policy, leading our Everglades restoration efforts and working closely with the U.S. Army Corps of Engineers (Army Corps), as the federal sponsor for these restoration efforts. We appreciate the consistency of the U.S. House of Representatives Committee on Transportation and

Infrastructure in passing Water Resources Development Acts on a biennial basis since 2014 and the willingness to conduct important oversight hearings.

Protecting waterbird populations is a foundation of the establishment of the National Audubon Society. In 1896, Harriet Hemenway and Minna B. Hall formed the Massachusetts Audubon Society amid outrage over the slaughter of millions of waterbirds, particularly egrets and other wading birds who were killed for the harvest of their feathers. The first Audubon Societies were formed to tackle the dire threats that birds faced from prolific plume hunting, and to obtain strong legal protections for birds [1]. By 1898, Audubon Societies were established in 14 states, including New York, Pennsylvania, Ohio, Texas, and California. The present-day Audubon began as the National Association of Audubon Societies in 1905 as an umbrella organization for these state societies. Theodore Roosevelt was an early, strong supporter of Audubon and Audubon worked closely with the President to establish the first bird sanctuary in Florida, which became the basis for the National Wildlife Refuge System.

In 2018, Audubon celebrated the "Year of the Bird," alongside National Geographic, Cornell Lab of Ornithology, and more than 180 other partners, including state agencies, zoos, businesses and conservation groups, to mark the 100-year anniversary of the Migratory Bird Treaty Act (MBTA). As Audubon recognized this centennial and marked the progress made since the passage of this landmark conservation law, we recommitted our organization to continue the work of our founders as we seek to protect birds over the next century.

With an eye toward this history, Audubon's water strategy focuses on protecting and restoring habitat that is crucial to birds' survival. Among other places, we focus our efforts in the Arid West through conservation around the Colorado River and the network of Saline Lakes, the Mississippi River and its Delta, the Great Lakes, the Everglades, the Delaware River, the Platte River and the Rio Grande. Audubon works to ensure that water conservation projects and programs that benefit birds are included in WRDAs. Audubon also works collaboratively with the Army Corps in many capacities, including through the Continuing Authorities Program, in the Upper Mississippi River Systemic Forest Stewardship Plan and through data collection and monitoring. This testimony highlights some of these issues that have received attention in recent WRDA bills.

1. Ecosystem Restoration Mission of the U.S. Army Corps of Engineers

The Army Corps has three primary mission areas: navigation, flood risk management, and aquatic ecosystem restoration. Army Corps ecosystem restoration activities seek to restore significant ecosystem function, structure, and dynamic processes. Ecosystem restoration efforts often involve an examination of the problems contributing to the system degradation, and the development of alternative means for their solution. Continued commitment of resources to this mission area will enable the Army Corps to make progress on critical ecosystem restoration efforts like those discussed in more detail below.

Restoring America's Everglades:

The Everglades is a unique ecological treasure that provides the drinking water for one in three Floridians. As projected population growth and impacts from climate change put more pressure on South Florida's environment, Everglades restoration is increasingly urgent. Clean and sufficient freshwater forms a critical component of Florida's tourism economy. Recent toxic blue-green algal blooms, seagrass die-offs and outbreaks of red tide have occurred where the alteration of the ecosystem limits water management options. Significant economic losses have transpired as a result of these water quality and water management disasters.

The Comprehensive Everglades Restoration Plan (CERP) was authorized in WRDA 2000 and represents the Army Corps' largest aquatic ecosystem restoration initiative to move the right amount of freshwater to the right places at the right time. After nearly 20 years of progress and bi-partisan support, five major Everglades infrastructure projects were recently completed or are expected to be complete by the end of 2020.

After a devastating flood in 1947, the Central and Southern Florida Flood Control Project (C&SF Project) was authorized as part of the Flood Control Act of 1948. After the implementation of the C&SF project resulted in both periods of drought

[1] Graham, Frank, Jr. (1990). The Audubon Ark. University of Texas Press, Austin, Texas.

and flooding and a decline of 90% of wading birds in the Everglades[2], Congress authorized a Comprehensive Review Study of the C&SF project in 1992 (Restudy). The purpose of the Restudy was to modify the C&SF project to restore the Everglades and Florida Bay ecosystems while providing for other water-related needs of the region. The Restudy culminated in CERP, which was then authorized by Congress in 2000. Each component of CERP is identified by the Army Corps as part of the C&SF project and CERP projects are funded under a line item for "South Florida Ecosystem Restoration." CERP was broken up into more than 60 components, and eight of these were authorized in WRDA 2007, 2014, and 2016. Three additional components are in planning stages and expected to have a Chief of Engineers Report within the next two years. Because individual projects are all included within a single appropriations line item, and because CERP itself is an extension of the original C&SF Project, these components build upon ongoing construction work and should not be considered new construction or new planning starts.

A study conducted by Mather Economics, *Measuring the Economic Benefits of Everglades Restoration*,[3] demonstrates the potential economic benefits from Everglades restoration:

> "Our analysis strongly suggests that restoration of the Everglades as described and planned in [Comprehensive Everglades Restoration Plan] will have large economic benefits. *Our best estimate is that restoration will generate an increase in economic welfare of approximately $46.5 billion in net present value terms that could range up to $123.9 billion*. The return on investment, as measured by the benefit-cost ratio, assuming a cost of restoration of $11.5 billion, is also high and significant, 4.04, which means for every one dollar invested in Everglades restoration $4.04 dollars are generated. Everglades restoration will also have an incremental impact on employment of about 442,000 additional workers over 50 years. In addition, the Corps of Engineers estimates there will be 22,000 jobs created as a result of the actual restoration projects. Throughout our analysis, we have taken a very conservative approach to estimation. Accordingly our best estimates almost surely understate the return on investment of Everglades restoration."

The Central Everglades Planning Project (CEPP) that was authorized in WRDA 2016, was a culmination of important planning efficiencies. The project planned multiple components together to understand their interconnected impact, it included more robust technical input from stakeholders, and the plan was developed in 18 months, which became a model for the Army Corps' 3x3x3 process which requires projects to be developed in 3 years, with $3 million, with review by 3 levels Army Corps leadership.

Through one of the most successful examples of the use of authority created by Section 203 of WRDA 1986 (P.L. 99–662), the non-federal sponsor for CERP, the South Florida Water Management District, prepared a CEPP Post Authorization Change Report Feasibility Study and Draft Environmental Impact Statement and recommended the additional of the Everglades Agricultural Area Reservoir to the CEPP project. The study was determined to be feasible by the Assistant Secretary of the Army for Civil Works and was included in WRDA 2018.

WRDA 2018 Section 1308 directed that construction should commence "only after the Secretary prepares a report that addresses concerns, recommendations, and conditions identified by the Secretary," allowing 90 days for completion of that report. While more than six months has passed, the report has still not been delivered to Congress.

The EAA Reservoir will store and clean water from Lake Okeechobee and then reroute it south. This has the dual benefit of diminishing harmful discharges to the coastal estuaries east and west of Lake Okeechobee that fuel algal blooms, and instead deliver clean water to Everglades National Park and Florida Bay where it is desperately needed.

Another issue that can impact the benefits that can be achieved from Everglades restoration is the need to secure the federal cost-share portion of Operation, Maintenance, repair, replacement and rehabilitation (OMRR&R) funds for completed Everglades restoration projects.

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[2] Davis, S., and J.C. Ogden. (1994). Everglades: The Ecosystem and its Restoration. St. Lucie Press, US

[3] Mather Economics. (2010). Measuring the Economic Benefits of Everglades Restoration: An Economic Evaluation of Ecosystem Services Affiliated with the World's Largest Ecosystem Restoration Project. Mather Economics, 43 Woodstock Street, Roswell, Georgia 30075.

Per WRDA 2000 section 601(e)(4), the Army Corps and the non-federal sponsor are each responsible for 50% of the costs of OMRR&R. "(4) OPERATION AND MAINTENANCE—Notwithstanding section 528(e)(3) of the Water Resources Development Act of 1996 (110 Stat. 3770), the non-Federal sponsor shall be responsible for 50 percent of the cost of operation, maintenance, repair, replacement, and rehabilitation activities authorized under this section."

The federal contribution in this context is therefore not a reimbursement—it is an obligation under CERP. Funds not received from the Army Corps pose a direct impact to the local sponsor and taxpayers, since these funds do not come from state appropriations. While it was reassuring to see some OMRR&R funding in the FY20 budget, not receiving this funding consistently could erode the agreed-upon partnership between the Army Corps and the non-federal sponsor and cast unnecessary doubt on the ability to gain the needed benefits from future projects.

Audubon appreciates the consistent support from this committee for Everglades restoration and looks forward to working together to build upon the momentum of restoration success.

Addressing Asian Carp in the Great Lakes:

The Great Lakes ecosystem is another globally important place for birds where Audubon focuses its water conservation efforts. The Great Lake includes about 20% of the freshwater on Earth and provide a source of freshwater for 30 million Americans. One of the greatest ecological threats to the health of the Great Lakes is the invasion of invasive exotic Asian carp. This species poses a serious threat to the ecological health of the Chicago Area Waterways System and the Great Lakes, and the people and economies these waters support. Right now, Asian carp have already wreaked havoc on the Mississippi and Illinois Rivers, outcompeting native fish for food and habitat, and creating a safety threat for people who recreate on these waterways. The environmental and economic consequences are significant. The Great Lakes support a $7 billion fishery; a $16 billion tourism industry; waterfowl production areas that support a hunting economy of $2.6 billion a year; and hunting, fishing, and wildlife observation that generates approximately $18 billion a year.

The Great Lakes Mississippi River Interbasin Study–Brandon Road Report (GLMRIS–BR) evaluated options to prevent the upstream transfer of Asian carp. A Chief of Engineers Report for this project was recently signed after encouragement in WRDA 2018, and authorizing this project should be a top priority in future WRDA legislation.

Asian carp are a real threat to the Great Lakes that demand quick action. There is no turning back if Asian carp invade the Great Lakes. It is much easier to control and prevent Asian carp at one relatively small choke point than in five massive lakes. The recommended plan will create additional levels of defense to stop Asian carp from migrating through the Chicago Area Waterway System.

Protecting the Delaware River Watershed:

In the Water Infrastructure Improvements for the Nation Act, (PL 114–332) that included WRDA 16, the Delaware River Basin Conservation Act (DRBCA) created the Delaware River Basin Restoration Program (DRBRP) in the U.S. Fish and Wildlife Service, clearly affirming the national priority of restoring the Delaware River Watershed. The DRPRP provides a competitive grant and technical assistance program to support on-the-ground work by state and local governments, non-profit organizations, and universities.

The Delaware River Basin Commission is a federal-state compact agency tasked with overseeing a unified approach to managing the basins' water resources. The Army Corps is the federal representative for this commission. Despite the recognition of importance of the commission in the DRBCA, full funding for the Army Corps' participation has not been appropriated in recent years. In order to advance the goals of DRBCA, support for both the DRBRP alongside the DRBC is imperative.

Projects that benefit the Everglades, the Delaware River Watershed and the Great Lakes are just a small portion of the many projects and programs that advance ecological benefits through WRDA bills. As the future needs for WRDA legislation take shape, ecosystem restoration must remain on par with other Army Corps mission areas and be prioritized. Restoring America's great aquatic ecosystems are fundamental for wildlife, the environment and local economies.

2. FACILITATING THE USE OF NATURAL INFRASTRUCTURE:

In 2018, Audubon released a *Natural Infrastructure Report: How Natural Infrastructure Can Shape a Resilient Coast for Birds and People*.[4] This report demonstrated how federal investment in natural infrastructure will help increase preparedness of coastal communities and economies, while benefitting fish and wildlife, which also often provide a critical foundation for coastal economies. Natural infrastructure alternatives can also provide more resilient options for inland flood attenuation and water storage in places like the Colorado River basin.

Provisions in WRDA 16 and WRDA 18 present important opportunities to incorporate the use of more resilient natural infrastructure options to address extreme weather events including flood risk management projects and hurricane and storm risk reduction projects.

WRDA 2016, Section 1184 states:

> In studying the feasibility of projects for flood risk management, hurricane and storm damage reduction, and ecosystem restoration, the Corps of Engineers (with the consent of the nonfederal sponsor) must consider: (1) natural features created through physical, geological, biological, and chemical processes over time; (2) human-designed, nature-based features engineered and constructed to provide risk reduction by acting in concert with natural processes; and (3) nonstructural and structural measures.

WRDA 2018, Section 1149 (c) states:

> NATURAL INFRASTRUCTURE.—In carrying out a feasibility report developed under section 905 of the Water Resources Development Act of 1986 (33 U.S.C. 2282) for a project for flood risk management or hurricane and storm damage risk reduction, the Secretary shall consider the use of both traditional and natural infrastructure alternatives, alone or in conjunction with each other, if those alternatives are practicable.

Despite these clear statutory directions, the Army Corps often screens out natural infrastructure alternatives early in the planning process, before their benefits can be fully analyzed. And it is extremely rare for the Army Corps to select a natural infrastructure alternative when compared with more traditional options to address flood and storm risks.

According to a March 2019 GAO report,[5] the agency faces considerable challenges in developing cost and benefit information for some types of natural infrastructure. While the Army Corps may consider direct incidental benefits such as improving ecosystems and water filtration, they often have difficulty monetizing such benefits. Additional information must be gathered in order to ensure that the Corps can better account for both indirect and direct natural infrastructure benefits and this should be incorporated into their benefit-cost analysis. The inability to properly monetize benefits is a consistent challenge preventing the Army Corps from selecting more natural infrastructure project alternatives.

Natural infrastructure alternatives can include nature-based systems such as restoring sand dunes, wetlands, oyster reefs and coastal forests in place of traditional human-built projects such as seawalls, jetties, levees, groins, bulkheads and riprap. This kind of "grey" infrastructure has traditionally been promoted as the best long-term, cost-effective approach to flood management. But natural infrastructure has been shown to provide significant, long-term and cost-competitive benefits for challenges such as flood reduction. For example, research published in the journal *Ocean & Coastal Management* reported that the average construction costs between natural and grey infrastructure are similar, but there are lower replacement costs with living shorelines, a form of natural infrastructure.[6]

The National Oceanic and Atmospheric Administration (NOAA) and the National Fish and Wildlife Foundation have also identified several flood-reduction and resiliency benefits from a wide array of natural infrastructure systems. "Natural features such as coastal marshes and wetlands, dune and beach systems, oyster and coral reefs, mangroves, forests, coastal rivers, as well as barrier islands, help mini-

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[4] National Audubon Society. (2018). Natural Infrastructure Report: How Natural Infrastructure Can Shape a Resilient Coast for Birds and People. Retrieved from https://www.audubon.org/sites/default/files/audubon_infrastructure_jan192018.pdf.

[5] U.S. Government Accountability Office. (2019). U.S. Army Corps of Engineers. Consideration of Project Costs and Benefits in Using Natural Coastal Infrastructure and Associate Challenges. (Publication No. GAO–19–319). Retrieved from GAO Reports Main Page via GPO Access database: http://www.gpoaccess.gov/gaoreports/index.html.

[6] Bilkovic, D. M., Mitchell M., Mason P., and Duhring K. (2016). The Role of Living Shorelines as Estuarine Habitat Conservation Strategies. *Coastal Management. Vol. 44* (3): 161–174.

mize the impacts of storms, rising sea levels and other extreme events on nearby communities and infrastructure."[7]

Wetlands and reefs:

The significant benefits provided by natural infrastructure have been analyzed by the private sector, including the insurance specialist Lloyd's of London, which concluded in a 2016 report that, "[t]here is strong evidence that reefs and wetlands help protect coastlines under everyday circumstances by reducing wave energy and raising elevations."[8] State agencies in flood-prone areas along the Atlantic coast concur. The Mid-Atlantic Regional Council on the Ocean, a partnership of five Mid-Atlantic States, noted that, "[c]oastal wetlands can serve as an initial but important line of defense to protect coastal cities, towns and infrastructure from climate-related impacts by storage, conveyance, and wave attenuation."[9] Nationwide, NOAA has found that peak floods can be reduced by up to 60 percent in watersheds that contain 15 percent wetlands.[10] NOAA estimates that across the United States, coastal wetlands are estimated to provide $23.2 billion in storm protection services every year.[11]

Wetlands provided significant flood-buffering benefits to the states impacted by Hurricane Sandy. According to an analysis in *Scientific Reports*, coastal wetlands reduced flood heights and thus avoided more than $625 million in flood damages across the 12 coastal states affected by Hurricane Sandy, from Maine to North Carolina.[12] Among the four states with the greatest wetlands cover—Maryland, Delaware, New Jersey, and Virginia—wetlands are estimated to have reduced flood damages between 20 to 30 percent. Coastal wetlands in Virginia, Maryland, and Delaware also helped save the largest number of roadways from Sandy's damaging impacts—about 833 miles. Overall, more than 1,400 miles of roads and highways were protected by wetlands during Hurricane Sandy.[13]

Eelgrass and seagrass beds:

A variety of experts have evaluated the coastal resiliency benefits provided by eelgrass and seagrass beds. The National Institutes of Health reported that eelgrass can slow erosion and stabilize sediment loss by "attenuating hydrodynamic energy from currents and waves, and thereby trap suspended sediment and cause sediment accretion."[14] The roots of seagrass beds have been shown to mitigate erosion by decreasing or slowing wave impacts on nearshore areas.[15]

Oyster reefs:

The American Planning Association (APA) and American Society of Civil Engineers (ASCE) examined elements of naturally resilient communities and concluded that oyster reefs can have a significant impact in moderating storm damages on nearby communities. "Oyster reefs serve as natural breakwaters—their physical structure absorbs the force of waves, creating calmer waters on the shoreline side of the reef and reducing the impacts of erosion. Studies from the Gulf of Mexico

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[7] National Oceanic and Atmospheric Administration and National Fish and Wildlife Foundation. (2018). National Fish and Wildlife Foundation and NOAA announce new coastal resilience funding. Retrieved from https://www.noaa.gov/media-release/national-fish-and-wildlife-foundation-and-noaa-announce-new-coastal-resilience-funding.

[8] Lloyd's Tercentenary Research Foundation. (2016). Coastal Wetlands and Flood Damage Reduction: Using Risk Industry-Based Models to Assess Natural Defenses in the Northeastern USA.

[9] Environmental Law Institute for the Mid-Atlantic Regional Council on the Ocean. (2017). Developing Wetland Restoration Priorities for Climate Risk Reduction and Resilience in the MARCO Region. Retrieved from https://www.eli.org/sites/default/files/eli-pubs/developing-wetland-restoration-priorities-climate-risk-reduction-and-resilience-marco-region.pdf.

[10] National Oceanic and Atmospheric Administration. Apply It: Understand—Conserving Coastal Wetlands for Sea Level Rise Adaptation. https://coast.noaa.gov/applyit/wetlands/understand.html. Accessed July 1, 2019.

[11] National Oceanic and Atmospheric Administration, Office for Coastal Management. Fast Facts: Natural Infrastructure. https://coast.noaa.gov/states/fast-facts/natural-infrastructure Accessed July 1, 2019.

[12] Narayan, S, et al,. (2017). The Value of Coastal Wetlands for Flood Damage Reduction in the Northeastern USA. *Scientific Reports*. No. 9463.

[13] PBS News Hour. (2017). Wetlands stopped $625 million in Hurricane Sandy. Can they help Houston? Retrieved from https://www.pbs.org/newshour/science/wetlands-stopped-650-million-property-damage-hurricane-sandy-can-help-houston.

[14] Nordlund LM, Koch EW, Barbier EB, Creed JC (2016). Seagrass Ecosystem Services and Their Variability across Genera and Geographical Regions. *PLoS ONE Vol.11* (10).

[15] Norlund, L.M., et al. (2018). Seagrass Ecosystem Services—What Next? *Marine Pollution Bulletin. Vol. 134* (145–151).

have found that oyster reefs are capable of reducing the energy of high power waves by as much as 76 to 93 percent."[16]

In fact, living shorelines constructed of oyster reefs have proven to be more effective than bulkheads in protecting shoreline areas. Researchers reported in the journal *Ocean & Coastal Management* that in North Carolina's Outer Banks, living shorelines protected nearby shoreline areas from the impact of Hurricane Irene, whereas 75 percent of regional bulkheads were damaged.[17]

Barrier islands, spits and dunes:

In their evaluation of naturally resilient communities, the APA and ASCE examined the role that barrier islands and beaches can play in protecting upland communities from storm impacts, finding that "[b]eaches are capable of reducing impacts from coastal storms by acting like a buffer along the coastal edge and absorbing and dissipating the energy of breaking waves, either seaward or on the beach itself. Dunes serve as more of a barrier between the water's edge and inland areas, taking the brunt of larger storm surges."[18]

Additional benefits from natural infrastructure:

In addition to providing storm-buffering benefits that can be as or more effective than grey infrastructure, there are benefits provided by natural infrastructure that are often absent in grey infrastructure, making natural infrastructure an even more appealing approach to floodplain management.

Natural Infrastructure can provide habitat that supports the economically vital recreational and commercial seafood industries. Wetlands not only absorb impacts from storms, thereby protecting upland communities from damaging impacts, they also provide vitally important habitat that is the lynchpin for the commercial and recreational fishing industries. According to Florida State University researchers, marshes in Florida provide up to $7,000 per acre in value for recreational fishing.[19] Barrier islands also play a vital role in protecting areas that are critical to commercial fishing. According to NOAA, barrier islands in Texas protect sheltered bays and estuaries from storm impacts, and these bays and estuaries are the foundation of a seafood industry that generates $846 million and supports more than 14,000 jobs.[20] Elsewhere in the Gulf of Mexico, 3.5 miles of oyster reefs significantly reduce the height and energy of waves while contributing to more than 6,900 pounds of additional commercial and recreational catch.[21]

Water quality benefits can also be achieved by using natural infrastructure alternatives that reduce excess nutrients. Along with stabilizing shorelines and preventing erosion, coastal wetlands can also "improve water quality by filtering, storing, and breaking down residential, agricultural and urban runoff."[22]

Grey infrastructure like seawalls, groins and jetties, cannot adapt to changes in the nearby environment. In contrast, wetlands and islands can be responsive to changing conditions and adapt to them, thereby continuing to provide storm protection benefits as well as habitat. As NOAA has observed, "Evidence suggests that coastal dunes dominated by native plants are better able to move inland in response to sea level rise while maintaining their integrity and protecting inland habitats and land uses."[23] NOAA has documented the responsive, adaptive behavior displayed by oyster reefs and eelgrass beds. These coastal resiliency benefits "are in-

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[16] Naturally Resilient Communities. Oyster Reefs. A http://nrcsolutions.org/oyster-reefs/. Accessed July 5, 2019.

[17] Gittman, R.K., A.M. Popowich, J.F. Bruno, and C.H. Peterson. (2014). Marshes with and without sills protect estuarine shorelines from erosion better than bulkheads during a Category 1 hurricane. *Ocean & Coastal Management Vol. 102* (94–102).

[18] Naturally Resilient Communities. Beaches and Dunes. http://nrcsolutions.org/beaches-and-dunes/. Accessed July 5, 2019.

[19] Hughes, R. (2017). How Can We Prevent Salt Marsh Die-Off? *The WFSU Ecology Blog. Vol. 27.*

[20] NOAA Office for Coastal Management. Barrier Island Restoration. https://coast.noaa.gov/states/stories/barrier-island-restoration.html. Accessed July 5, 2019.

[21] Sutton-Grier, A.E., et al. (2015). Future of Our Coasts: The Potential for Natural and Hybrid Infrastructure to Enhance the Resilience of Our Coastal Communities, Economies and Ecosystems. *Environmental Science & Policy Vol. 51* (137–148).

[22] Environmental Law Institute for the Mid-Atlantic Regional Council on the Ocean. (2017). Developing Wetland Restoration Priorities for Climate Risk Reduction and Resilience in the MARCO Region. Retrieved from https://www.eli.org/sites/default/files/eli-pubs/developing-wetland-restoration-priorities-climate-risk-reduction-and-resilience-marco-region.pdf

[23] Environmental Law Institute for the Mid-Atlantic Regional Council on the Ocean. (2017). Developing Wetland Restoration Priorities for Climate Risk Reduction and Resilience in the MARCO Region. Retrieved from https://www.eli.org/sites/default/files/eli-pubs/developing-wetland-restoration-priorities-climate-risk-reduction-and-resilience-marco-region.pdf

creasingly important to buffer shorelines against sea level rise and increased storm surge and frequency."[24]

Grey infrastructure, such as seawalls, jetties, groins, and bulkheads, can exacerbate erosion in nearby areas, intensifying flood risks for properties and communities located in the erosion-impacted areas. Researchers with the University of Pennsylvania and the Pennsylvania State University documented these impacts, noting that, "when seawalls are constructed on eroding beaches, the erosion continues so that the beach in front of the seawall can become very narrow or disappear completely. And while groins and jetties trap sediment on the updrift side resulting in shoreline accretion, there is corresponding shoreline erosion on the downdrift side due to the interruption in longshore transport."[25] Natural infrastructure, such as oyster reefs, restored wetlands, living shoreline installations, and green spaces provide flood protection benefits without negative impacts in nearby areas.

The Army Corps implementation guidance around WRDA 2018 Section 1149 (c) states that the Corps is already implementing this provision. However, the Congressional intent of producing more robust analysis and greater use of natural infrastructure alternatives has in fact not come to fruition. Looking ahead to WRDA 2020, additional efforts to overcome hurdles related to the benefit-cost analysis and other issues that can enable the Army Corps to make greater use of natural infrastructure should be pursued.

3. Beneficial Use of Dredged Material:

WRDA 2018 Section 1130 authorized a two-fold increase in the number of beneficial use of dredged materials (BUDM) pilot projects. Audubon has worked with the Army Corps and state partners to use dredged material to restore habitat that is important to birds and outdoor recreation economies. This work has created and restored islands that provide excellent nesting habitat for seabirds and shorebirds, including state-listed species of conservation concern such as Black Skimmers, American Oystercatchers, and Least Terns, and is leading innovations in thin-layer dispersal of dredged sediment to protect tidal marsh habitat in the face of sea-level rise. Audubon looks forward to building upon our collaborative efforts in Connecticut, North Carolina, Maine, Maryland, Florida and Texas. In South Carolina, Audubon is working to implement the Crab Bank project that was selected as a BUDM pilot project in 2019.

To further facilitate the continued use and expansion of this important win-win program, funding must be dedicated to its implementation. A number of projects selected as pilot efforts under WRDA 2018 Section 1130 and WRDA 2016 Section 1122 have only been able to proceed using funding from the Army Corps Continuing Authorities Program because appropriations for the program has not followed the new authorizations.

In addition, Audubon supports on-going efforts within the Army Corps to develop and implement best management practices for coastal engineering projects that benefit shoreline-dependent species that can be incorporated into beneficial use of dredged material projects. More information can be found in a recent U.S. Army Engineer Research and Development Center Technical Note.[26]

4. Ensuring new projects avoid adverse environmental impacts

As projects authorized or approved in WRDA 16 and WRDA 18 advance, significant effort must be made to avoid adverse environmental impacts. For example, Audubon has expressed opposition to any projects or activities on the Pearl River in Mississippi, that involve destroying wetlands and wildlife habitat that will imperil birds, fish and wildlife, alter local and downstream river hydrology, impair water quality and threaten public and environmental health.

In WRDA 2018, Section 1176 sought to establish a demonstration program to advance a 2018 Integrated Draft Feasibility and Environmental Impact Statement for the Pearl River Basin, Mississippi, Federal Flood Risk Management Project, Hinds and Rankin Counties, Mississippi. The plan was prepared by the Rankin-Hinds

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[24] NOAA, California Coastal Conservancy, et al. (2017). Case Studies of Natural Shoreline Infrastructure in Coastal California. Retrieved from http://scc.ca.gov/files/2017/11/tnc_Natural-Shoreline-Case-Study_hi.pdf

[25] University of Pennsylvania, The Pennsylvania State University, et al., "Coastal Processes, Hazards, and Society." https://www.e-education.psu.edu/earth107/node/1066

[26] Guilfoyle, M.P., Jung J.F., Fischer R.A. and Dickerson, D.D. (2019). Developing Best Management Practices for Coastal Engineering Projects that Benefit Atlantic Coast Shoreline-dependent Species. Technical Note developed by the U.S. Army Engineer Research and Development Center—Environmental Laboratory.

Pearl River Flood and Drainage Control District, whose preferred alternative is known locally as the "One Lake" project.

WRDA 2018 Section 1176(b) directs "the Secretary to determine that the project is technically feasible, economically justified, and environmentally acceptable," while Section 1176(d) acknowledges that "the non-Federal sponsor shall design the project in a manner that addresses any potential adverse [downstream] impacts [to the Pearl River Basin] or that provides mitigation." These requirements must be specifically adhered to if the projects proceeds. Before the Secretary performs any project review, all Environmental Impact Statement and Feasibility Study documents must fully comply with all required federal laws. This must include, but not be limited to the National Environmental Policy Act, provisions of Water Resources Development Act of 1996, Clean Water Act, Endangered Species Act, Fish and Wildlife Coordination Act, Marine Mammal Protection Act, Coastal Zone Management Act, and the Rivers and Harbors Act. This information also must be officially noticed in the Federal Register with proper and timely review provided to the public, natural resource agencies, and other interested stakeholders.

The study cannot be limited to the proposal's immediate footprint but must be expanded to fully encompass rigorous upstream and downstream modeling and associated scientific analyses for all river miles above and below the proposed activity, including the coastal zones of Mississippi and Louisiana.

The Pearl River is a 490 mile-long waterway, shared by Mississippi and Louisiana, which is recognized as one of the most intact river systems in the southeast U.S. while serving as a major input of freshwater into the Gulf of Mexico. Thus, a Programmatic EIS should be required to thoroughly quantify any demonstration project's primary, secondary, and cumulative impacts on the basin's flora and fauna. This should include at a minimum, impacts on downstream natural resources and existing industrial users and commercial sectors (i.e., seafood, tourism), Important Bird Areas, 125,000+ acres of existing conservation lands, alterations to wetland habitats that help to protect communities from flooding and storm events, and impacts to multi-million dollar restoration projects planned or underway across the Central Gulf Coast.

Over the past forty years, there has been an effort to address flooding in the Pearl River Basin. Several flood control plans have been developed. Many of these plans have inappropriately incorporated economic development as a goal. Any demonstration program should place priority on natural infrastructure solutions, as discussed above and should be required to evaluate less ecologically damaging and more comprehensive flood control measures. Some examples include flood-proofing existing homes and buildings; better management of existing infrastructure (i.e., Ross Barnett Reservoir); selectively elevating structures, buy-outs or relocations; setbacks from existing levees; floodplain restoration within the river basin; and development and implementation of a comprehensive flood and stormwater Master Plan for metropolitan areas (i.e., City of Jackson) to coordinate water management. A detailed, publically vetted mitigation plan should be submitted to and approved by the Secretary and the appropriate funding for mitigation set aside in a secure fund allocated for this express purpose.

Any and all mitigation required for activities in the Pearl River Basin should be in-kind, occur within the established watershed boundary, and be identified and tentatively procured prior to the Secretary's approval.

5. Preliminary Views looking ahead to the next Water Resources Development Act

As development of the next WRDA begins, ecosystem restoration and the use of natural infrastructure should be prioritized. As climate change creates more challenges associated with stronger storms, increased flooding in some areas and drought in others, projects directed toward providing ecological benefits can increase climate resiliency. It is more efficient to invest in projects that increase resiliency than to react after an extreme weather event occurs.

Audubon also supports robust funding for the Clean Water State Revolving Fund and other programs that provide financing to help communities address water quality and water management infrastructure needs.

Attempts to exempt Army Corps projects from environmental laws should also be rejected. As innovative efforts continue to advance projects more quickly, compliance with environmental laws can ensure that projects benefit both birds and people.

Thank you again for the opportunity to testify on these important issues. Audubon is ready to work with the Subcommittee and others to advance important water conservation issues looking ahead to the next Water Resources Development Act in

ways that will help protect birds and the places they need. We know that where birds thrive, people prosper.

Mrs. NAPOLITANO. Thank you, Ms. Julie Hill-Gabriel, for your testimony.

And we now turn to Mr. Derek Brockbank. You are recognized.

Mr. BROCKBANK. Thank you.

America has an engineered shoreline. Nearly every beach on the east and gulf coast and many on the Pacific and Great Lakes coasts have been restored, renourished, and reengineered to mimic natural systems, and estuarine systems from Louisiana to San Francisco Bay are engineered, either armored with bulkheads and riprap or preferably with natural infrastructure, such as restored wetlands and living shorelines.

What connects our shorelines is the need for sand and sediment. Sand and sediment are the building blocks of a healthy coastline. Beaches and wetlands are dynamic systems that should naturally be eroding and rebuilding, but too often they cannot rebuild because we have prevented sediment from ever reaching the coasts.

Levees prevent flooding and sediment deposition. Hardened cliffs, riverbanks, and dams keep sediment out of waterways, and jetties and dredging send sediment far offshore.

We are facing a coastal sediment crisis, and that is before we consider the challenges of rising sea levels and localized subsidence.

American Shore and Beach Preservation Association has been working with the Army Corps of Engineers for nearly 100 years to merge science and policy to protect, restore, and enhance our Nation's coastlines.

We are an organization of beach and coastal practitioners. We are the communities, industry, local elected officials, and academics who build, maintain, manage, and research our Nation's beaches and shorelines.

Thank you for inviting us to speak here today.

We believe the most fundamental thing the Army Corps can do to better manage coastlines is operate under principles of regional sediment management, or RSM.

This is a concept that sediment is a resource, not a waste product, and managing sediment within a watershed or littoral system, not a project-by-project basis, is more ecologically sound and saves money.

In short, we need to move sediment within a system, not remove it.

RSM goes well beyond just reusing dredge material, but an important part of RSM is beneficial reuse. The Corps dredges about 214 million cubic yards of sediment per year from navigation channels. Of that, about 38 percent is used beneficially.

And while hitting .380 might get a baseball player into the All-Star Game, the Corps should strive to bat 1.000 and beneficially use 100 percent of uncontaminated dredge material.

The Transportation and Infrastructure Committee has long sought to support RSM and beneficial use. WRDA 2016, section 1122, has proven to be tremendously popular with local communities.

Last year in the span of a month, 94 projects were submitted to be 1 of the first 10 beneficial uses of dredge material pilot projects.

After some delays, the Corps can and should implement and highlight these projects as beacons of what can happen when Feds and locals work together to manage a scarce resource.

A beneficial use must be systemic across the Army Corps. One way to do this is to change the understanding of the Federal standard.

As part of the Army Corps determination of the least-cost alternative for the disposal of dredge material, the Corps should include the economic evaluation of sand, including potential ecosystem restoration benefits, storm damage reduction benefits, and other economic values and long-term costs.

The next fundamental way to improve coastal project development and prioritization is modifying the Corps' benefit-cost ratio process, the BCR process. BCRs ensure that the Federal taxpayers only pay for projects that provide positive economic benefits.

However, in designating a project authorized as flood risk reduction or coastal storm risk reduction, the Corps will only calculate benefits derived from reducing flood risk. So that project will not be designed to support other benefits, such as habitat or the economy.

Furthermore, a project that does have multiple benefits must compete for Federal dollars with no advantage against projects that have a single benefit. In the case of beaches, the economic value can be remarkably high.

Economist Dr. James Houston has calculated that beach travel and tourism generates $285 billion to the national economy and $23 billion in Federal tax revenue annually.

These types of economic figures ought to be considered when deciding which flood risk management projects to prioritize.

WRDA 2018 did authorize a National Academies and a GAO study to look at Army Corps dredging practices, and these studies will help inform the Corps BCR process, but by themselves they do not actually change anything.

The Corps BCR for flood risk management projects is an archaic tool that needs to be modernized. Congress needs to direct the Corps to update its BCR process, either to consider the full array of benefits or to develop a new methodology for prioritization that incorporates a project's secondary benefits.

The result of advancing RSM and beneficial use and reforming the Corps BCR will be an improved decisionmaking framework that appropriately values natural infrastructure, the beaches, dunes, and wetlands that provide flood risk reduction, but so much more.

Army Corps mandates are too broad and the challenges of the coast too great for the Corps to continue to focus on projects that only solve one problem at a time. Natural infrastructure provides flood risk benefits, ecological benefits, economic and recreation benefits.

The Corps has been building beaches for 100 years and restoring wetlands for 50 years. So the concept of natural infrastructure is not new. The next step is for the Corps to maximize multiple benefits for individual projects and within coastal systems.

Finally, the needs of our Nation's coastline are too enormous to be solved by policy changes and authorized projects in WRDA alone. Our country must make major investment in infrastructure that includes dedicated support for coastal resilience and natural infrastructure.

ASBPA looks forward to working with the T&I Committee to address these challenges in WRDA and any future infrastructure legislation.

Thank you.

[Mr. Brockbank's prepared statement follows:]

Prepared Statement of Derek Brockbank, Executive Director, American Shore and Beach Preservation Association

AMERICA'S ENGINEERED SHORELINE

America has an engineered shoreline. The most iconic beaches in the country have all been restored, renourished, and re-engineered to mimic natural systems. The beaches of the Jersey Shore, Virginia Beach, Miami Beach, Galveston, Malibu, Santa Monica, and Waikiki are part of our national coastal infrastructure that has been engineered with nature as a guide. Coney Island was the first significantly engineered beach, renourished back in 1923. Today, nearly every beach on the East and Gulf Coast, and many on the West and Great Lakes coasts, have been engineered. Increasingly, even our estuarine and back-bay shorelines are engineered, either by "armoring" with bulkheads and riprap, or with more natural solutions such as restoration and living shorelines.

The U.S. Army Corps of Engineers (USACE), authorized by and acting under policy established in Water Resource Development Acts (WRDAs), has been building natural infrastructure and engineering with nature for a long time. And the American Shore and Beach Preservation Association (ASBPA) has been working with USACE for nearly a hundred years.

ASBPA is an organization of beach and coastal practitioners. We are the communities, industries, and academics who build, maintain, manage and research our nation's beaches and shorelines. We are geologists, engineers, town managers, elected officials, professors, students and coastal advocates. Our mission is to merge science and policy to protect, restore and enhance the U.S. coastline; we were founded in 1926 and have been advocating for a healthy coastline ever since.

ASBPA believes a healthy coastline, whether restored or natural, provides *four interconnected values* to coastal communities specifically and to the nation more broadly:

a) *Protection* from coastal storms, hazards and sea level rise, and as buffer to sensitive estuarine ecosystems;
b) *Ecologically valuable habitat* for birds, turtles, fish and other coastal plants and wildlife;
c) *Economic vitality* though tourism, shipping, fishing and other industries;
d) *Recreation* for tens (if not hundreds) of millions of Americans who visit the beach in greater numbers than all our national parks combined.

ASBPA would like to see these values maximized in USACE's management of our nation's shoreline. Doing so will take USACE using the full authorities provided to them, and Congress authorizing and encouraging USACE to use a multi-benefit approach to coastal management and project development.

WRDA

In the last two WRDAs, Congress has included a number of provisions that allows or directs USACE to manage the US coastline to achieve these multiple benefits. The three areas discussed here are:

1) *Regional Sediment Management* (RSM) and the *Beneficial Use of Dredged Material* (BUDM)
2) Modification of the *Benefit-Cost-Ratio* (BCR)
3) *Natural Infrastructure*.

REGIONAL SEDIMENT MANAGEMENT AND THE BENEFICIAL USE OF DREDGED MATERIAL

Regional Sediment Management (RSM) is a comprehensive approach to planning and integrating riverine and coastal projects with the core principle that sediment is a finite resource not to be wasted. RSM seeks to move sediment from where it is not wanted to where it is wanted, rather the simply *removing* sediment from the littoral system. RSM can reduce overall costs through cross-business line planning and budgeting. Beneficial Use of Dredged Material (BUDM) is one aspect of RSM, in which sediment dredged for navigation purposes is used to benefit a restoration and/or flood risk reduction project. Ultimately, ASBPA believes that USACE needs to evolve its budgeting and planning operations to reflect RSM principles so that *100% of uncontaminated dredged sediment is used beneficially*.

On average, USACE dredges about 214 million cubic yards of sediment per year from navigation channels nationwide. Of that, 82 million cubic yards (or 38%) is used beneficially on beaches, in wetlands, and in nearshore water each year.[1] This is a good first step, but in an era of sediment shortage—less sediment is reaching the coast than ever before due to dams, hardened riverbanks and cliff faces, and straightened channels—and rising seas, anything less than 100% beneficial usage is not enough.

One good example of RSM in practice is at the mouth of Columbia River in Oregon, where the USACE Portland District is working with partners to develop a network of nearshore placement sites for dredged sediment. The goal is to keep material in the littoral zone so that it feeds the beaches of Oregon and Washington through natural coastal processes. Placing 500,000 cubic yards of sediment in a nearshore site, with no more than five centimeters of accumulation on the seabed per disposal, has yielded $200,000 in cost savings to date, helped naturally maintain an eroding coastline, and yielded no crab mortalities (the primary environmental concern with nearshore placement in this region).

In another example of RSM, near St. Augustine, FL, the Jacksonville District has combined multiple federal projects so that timing of dredging and placement is aligned. They have also instituted inlet bypassing, so less sand accumulates in the St. Augustine Inlet and instead is distributed to a down drift shoaling area that distributes sand to eroding beaches. This resulted in a $2 million cost savings from reduced dredging and associated environmental mitigation efforts and by combining permits.

WRDA 2016 authorized a pilot program for BUDM (Sec. 1122), that was expanded in WRDA 2018 (Sec. 1216). Sec. 1122 was slow to get going: implementation guidance took a year to finalize, and after 90+ projects were submitted for the initial ten pilot projects, project selection took nearly another year. But the projects are now underway. One project, Deer Island Lagoon in MS, has been completed, and USACE has estimated the remaining nine will be in construction by FY2022, assuming current dredge timelines hold and construction funding is available.[2]

Local communities have widely supported the 1122 program. Washington State Department of Ecology (WADEC), the local sponsor for the "Grays Harbor South Jetty Placement" project, used this process to convene key stakeholders to plan for the beneficial use of dredge sediment to help protect shipping channel jetties, coastal beaches and nearshore habitats from erosion while avoiding and minimizing adverse impacts to environmental resources, and navigation safety. Through the development of the Grays Harbor project, WADEC identified additional opportunities for beneficial use in other parts of Washington, and developed a strategy to achieve economies of scale through coordination with local partners across the state—reducing the cost sharing challenges that many communities face. Although the Grays Harbor project is not impacting the Town of Ocean Shores, WA, Mayor Crystal Dingler has credited the 1122 process with helping her community by providing "*invaluable information concerning our ongoing erosion problems. This continued en-*

[1] Federal coastal navigation projects were inventoried to examine the extent to which RSM goals have been implemented across USACE at the project level. This study examined USACE navigation projects that beneficially reuse sediments dredged from Operations & Maintenance (O&M) projects nationwide. These data were derived from a comprehensive analysis of nearly 20 years of USACE dredging data at both the national and district level. The data have been quality checked, updated, and revised over the last five years through extensive interviews of USACE staff at the District, Division and HQ levels. *USACE RSM, 2019. USACE Navigation Sediment Placement: An RSM Program Database (1998–present), U.S. Army Corps of Engineers Regional Sediment Management Program*, https://gim2.aptim.com/rsm, accessed July 2, 2019.

[2] FY19 appropriations included an $8.5 million increase to CAP204 (BUDM) to $10 million with report language, "the Corps is directed to fund these pilots, if otherwise competitive, under the CAP Section 204 line item and the applicable additional funding line items in this account." FY20 Energy & Water appropriations passed by the House includes $7.5 million for "BUDM Pilot Program" as well as $20 million for CAP204 (BUDM).

gagement in our community process to address emergencies and support long-term strategies are critical to helping our community make resilient investments for our future. Without such data and assistance, we are operating blind."[3]

USACE has not publicly determined when or how the additional ten projects authorized in WRDA 2018 Sec. 1216 will be selected, but USACE and congressional appropriations committees have each indicated they would like to see the successful completion of the first ten pilot projects before constructing the next ten.

What else is needed:

The pilot project is an important step in directing USACE districts to think more broadly about how they can use dredged sediment and how they can work with local project sponsors. But this sort of approach must be systemic across USACE projects, not limited to a handful of pilot projects, or within districts that seek innovative approaches. One way to do this is to *change the understanding of the Federal Standard*. As part of USACE determination of the "least cost alternative" for the disposal of dredged material, the USACE should include the economic evaluation of the sand, including ecosystem restoration benefits, storm damage reduction benefits, and other economic values and long-term costs. Additionally, reconfiguring USACE's budgeting so that projects are not budgeted exclusively as navigation or flood risk management will allow for easier development of projects that efficiently manage sediment and can support both navigation and flood risk reduction.

BENEFIT-COST-RATIO

Benefit-cost-ratios (BCRs) for water resource infrastructure projects ensure the federal taxpayer is only paying for projects that provide positive economic benefits—when benefits outweigh costs. However, as currently implemented, USACE BCRs have two fundamental flaws:

a) BCRs are only calculated using the economically verifiable benefits of a project's primary purpose; and
b) Projects in wealthier communities inevitably get prioritized over projects in poorer communities, since the economic benefit of risk reduction is greater for valuable property than inexpensive property.

Using only the economically verifiable benefits of a project's primary purpose sounds sensible, but it means projects are designed to maximize just a single benefit, rather than balancing multiple benefits. A project that is intended to reduce flood risk, such as a beach and dune system, might also have tremendous value as habitat and in supporting a tourism-based economy. But in designing a project authorized as a "flood risk reduction" or "coastal storm risk reduction," *USACE will only calculate the benefits derived from reducing flood risk, so the project will not be designed to support habitat or the economy*. Furthermore, a project that does have multiple benefits must compete for federal dollars with no advantage against projects that have a single benefit.

In the case of beaches, the economic value and even the direct return on investment via tax revenue can be remarkably high. Economist Dr. James Houston has calculated that beach travel and tourism generates $285 billion to the national economy and $23 billion in federal tax revenue annually.[4] Additionally, beach tourism support 2.5 million jobs directly and 4.4 million jobs including direct, indirect, and induced impacts.[5] While USACE is not an economic development agency, and not in business to generate revenue for the U.S. Treasury, these economic figures ought to be considered when deciding which flood risk management projects to prioritize.

Second, prioritizing flood risk management projects based on calculation of avoided economic damage means projects in areas of a high concentration of wealth have a higher BCR than less wealthy or less densely populated areas. This may be a sensible market-based decision-making tool, but it exacerbates the problem of lower income communities living in flood-vulnerable areas without federal support in reducing risk. It also perpetuates a cycle of development in flood-vulnerable areas to increase the economic benefits derived from risk reduction measures. A *more sensible BCR or decision-making tool would account for the societal value created by reducing risk to low-income communities as well as valuing open space or other flood mitigation measures that are currently dis-incentivized by the BCR*.

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[3] Interview with Bobbak Talebi, Senior Coastal Planner, Shorelands & Environmental Assistance Program, Washington State Department of Ecology, July 2, 2019.

[4] Houston, J.R. 2018. "The economic value of America's beaches—a 2018 update." *Shore & Beach*, 86 (2), 3–13.

[5] Ibid.

WRDA 2018 authorized two studies to look at USACE budgeting practices, a National Academy of Science (NAS) study on USACE budgeting (Sec. 1103) and a General Accountability Office (GAO) study on Benefit-Cost Analysis Reforms (Sec. 1204). To ASBPA's knowledge Sec. 1103 has not been funded nor begun, while Sec. 1204 is currently underway. Both of these studies will help reform USACE's BCR process and should be completed as soon as possible.

What else is needed:

While studies are helpful in clarifying specific challenges to current policy or operating procedure, as well as recommending potential solutions or steps for improvement, they don't actually change anything. *USACE's BCR for flood risk management projects is an archaic tool that needs to be modernized*. Congress needs to direct the USACE to update its BCR process—either to consider the full array of benefits, or to develop a new methodology for prioritization that incorporates a project's secondary benefits. While this will support better projects whose primary purpose is flood risk management, it will also support better navigation projects that have multiple benefits (such as important BUDM placement sites, or ecological value in clearing channels).

NATURAL INFRASTRUCTURE

Wide beaches, high dunes, and verdant wetlands, reefs, mangroves and seagrass beds are essential to the 40% of Americans who live along the coast. Properly maintained, this natural infrastructure can improve communities' resilience and is itself resilient. Dunes and marshes can adapt to rising seas, and reefs and coastal forests regenerate after storm damage. The same can't be said for "grey" (concrete and steel based) infrastructure. USACE has been building beaches and dunes for flood risk reduction for nearly a century and restoring aquatic ecosystems for more than half a century. It should be looking at how to fully integrate these missions in combination with its mandate to maintain coastal navigation. By doing so, USACE can more effectively restore and rebuild our nation's natural infrastructure, in collaboration with other federal, state and tribal agencies.

USACE has many authorizations to use natural infrastructure solutions and to consider natural and nature based features in place of more traditional grey infrastructure. Recent WRDAs have clarified and built upon previous authorizations:

- *WRDA 2016, Sec. 1154* authorized collaborative regional assessments on coastal resilience that prioritized natural infrastructure;
- *WRDA 2016, Sec. 1184* required "natural features" to be considered in feasibility studies;
- *WRDA 2018, Sec. 1149* specifically allowed "natural and nature based features" to be included in aquatic ecosystem and flood risk management projects;
- *WRDA 2016 & 2018* authorized regional coastal resilience studies in the South Atlantic, Great Lakes, and coastal Texas that included natural infrastructure solutions.

None of these were wholly new authorities requiring action from USACE, so implementation has been mixed. Districts that use "natural" solutions have more leeway to do so, but ASBPA hasn't seen a notable increase in use of natural infrastructure since 2016. ASBPA considers comprehensive coastal resilience studies to be invaluable and is pleased that the South Atlantic Coastal Study has been funded and is underway, and disappointed that the Great Lakes Coastal Resilience study has not received approval to begin as a new start and is still on hold.

What else is needed:

Rather than simply encouraging USACE to use or consider natural infrastructure in place of hard, grey infrastructure, *Congress should set policy on decision-making that will result in natural infrastructure being the preferred alternative due to its multi-benefit approach*. This means requiring an RSM approach to managing coastal navigation and restoration projects while beneficially using all uncontaminated dredged sediment; and reforming the BCR so that the full scope of benefits of natural infrastructure are included in project consideration. Additionally USACE's regulatory requirements should ensure natural solutions are as easy to permit as hard infrastructure. For example, USACE took a good step in creating a nationwide permit for living shorelines, but USACE could look at regulatory hurdles to natural infrastructure and ensure permitting is not easier for a comparable gray infrastructure project.

A FINAL THOUGHT ON THE USACE'S EFFORTS TO "REVOLUTIONIZE"

Many of the challenges the USACE has in modernizing to meet the needs of the 21st century—the ability to adaptively manage projects in the face of climate impacts, expediting project delivery, being reactive to the high and lows as well as delays in funding by the Administration and Congress—is not something Congress can directly fix. These challenges are procedural and cultural that will take years, if not decades, to fully address. ASBPA has been pleased with General Todd Semonite's call to "Revolutionize" USACE, as well as Director of Civil Works James Dalton's efforts at implementing procedures to allow USACE to operate as a risk-informed, not risk-averse institution.

But after Gen. Semonite and Mr. Dalton leave, these efforts will need to continue. It is incumbent on Congress, and the Transportation & Infrastructure (T&I) Committee specifically, to *provide oversight to ensure these procedural and cultural changes continue*. USACE is an essential agency as our nation faces the biggest coastal threats in history, and it needs to be operating efficiently and effectively.

CONCLUSION

As the T&I Committee reviews the success of recent WRDAs and develops policies for a 2020 WRDA, ASBPA encourages the committee to consider how USACE is able to advance coastal projects that have multiple benefits. USACE has been building beaches for 100 years and wetlands for 50 years, so the concept of restoring natural infrastructure with flood risk reduction, ecological, economic and recreation benefits is not new. But the next step is for USACE to maximize each of these values for individual projects and within coastal systems. This will take systemic changes to increase the beneficial use of dredged material, budgeting changes to ensure the full value of sediment is calculated and all benefits are included in a BCR, and on-going oversight to ensure procedural and cultural changes at USACE proceed.

Finally, the needs of our nation's coastline are too enormous to be solved with policy changes and authorized projects in WRDA alone. *Our country must make a major investment in infrastructure that includes dedicated support for coastal resilience and for waterways*. From sediment management to preparing for storms and rising seas, the challenges of our coastlines and our waterways are linked and must be solved together. The policy solutions described here—including RSM, BCR reform and natural infrastructure—all address these challenges. But to be successful these need significant federal funding and need to be part of a national infrastructure investment program. ASBPA looks forward to working with the T&I Committee to address these challenges in WRDA and in infrastructure legislation.

Thank you for considering our testimony, and we are happy to answer any questions.

Mrs. NAPOLITANO. Thank you, Mr. Brockbank.

We now recognize Dr. F. Martin Ralph.

Welcome.

Mr. RALPH. Good day. Thank you for the opportunity to be here, Chairman Napolitano and Ranking Member Westerman and the committee.

I am here to describe experience we are gaining on bringing weather forecast information into reservoir operations. It is an experimental effort. It is being done in very close collaboration with the Corps of Engineers and with local water agencies on the west coast.

We have brought scientists together in meteorology, in hydrology, in biology with civil engineers and water management, flood control, and the like to explore how this might work in the future.

Traditionally, forecast information on precipitation has not been able to be used directly in reservoir operations because historically, the skill has been extremely low. But one of the great accomplishments of science in our lifetimes has been the development of weather prediction that has some skill.

We have come to realize through those studies in the last several years that certain types of storms that affect the west coast we now

know as atmospheric rivers have some predictive skill. So I am going to take you to a time a few years ago with a reservoir in northern California on the Russian River, Lake Mendocino, and it was December, and a big atmospheric river had hit, had started to refill the reservoir a bit to where it should be.

Another one hit a few days later, encroached into the flood pool, and the possibility was there for another one to come. As the rules require for this operation, that reservoir, 25,000 acre-feet was released to restore the flood control pool. That flood control pool was then available if another storm had come, just as the rules had designed it to be.

As a meteorologist, I would say facing two ARs that had just hit and another one if it were to hit would be a serious problem. I think it was a smart move.

However, what happened and nobody could predict this at the time was the drought began, the worst drought on record in the area. The reservoir then declined over the next 13 months to its lowest point in a long time, and that created a bit of an issue for water supply, not only for the people, but for agriculture and also for an endangered species there. Salmon are a serious issue.

There is a biological opinion on this river, and the agencies that are responsible work very hard to try to keep that salmon alive.

So the Sonoma Water Agency, the Army Corps of Engineers, and a group of scientists led by myself and the chief engineer of Sonoma Water Agency got together a group to explore the possibility.

Hey, we have seen this atmospheric river phenomena develop in our science. We think there is predictability there. Is it possible that there is enough skill there that in that case in 2012 operators could have looked ahead several days and realized there is no AR coming? Let's save some of that water, pending the next day's forecast and whether or not there will be more storms coming enough to be concerned or not.

One of the special situations in this region of the world is atmospheric rivers are the driver of flood. So from a weather standpoint, our challenge about looking ahead boils down to we really do not care about the run-of-the-mill storms. We care about these atmospheric rivers. There are only a few each year, and they make or break the water year for much of the West.

They also can produce very beneficial precipitation in the case like in 2012, but then if it went too far, it creates a flood.

All right. So we got this team together to develop this workplan to decide if we could do a paper study. We had the Army Corps of Engineers fully represented on the committee, as well as the operator of the dam for water supply. So the operators were at the table.

We had scientists from hydrology and meteorology and others together with NOAA, USGS, the Bureau of Reclamation, and others who have expertise, and we developed a collaborative framework and developed a workplan that we agreed upon to proceed over the next several years to do a paper study, a paper study.

What we discovered in the first 2 or 3 years was that it looks very promising. So promising, in fact, that we were requested as a committee to submit a major deviation request.

That was reviewed, approved, and now the reservoir was operated this last winter under this major deviation very successfully, a fantastic example of the Corps working well with its partners and with scientists to develop new opportunities.

This has now led to additional studies in southern California, a very different environment, and in northern California. Each watershed is different. The weather is different, the climatology is different. The operating circumstances differ, and we are trying to take a look at this new method in these other areas in a systematic way to try to explore the potential of it.

Our committee believes that there is the possibility for this to be broadly applicable, but we have also come to recognize that in my own naive, nonhydrologist way, every reservoir is like a person. It has got its own personality.

Assuming what we find from one is going to apply to every other one is really not valid. So we are taking and developing a very systematic approach in close collaboration with water agencies that have to deliver water to customers and the Army Corps of Engineers, who often co-operate the reservoir in some fashion, with our scientists and the ecosystem experts to understand whether we can bring weather information in in a more reliable way to support water operations.

[Dr. Ralph's prepared statement follows:]

Prepared Statement of F. Martin Ralph, Ph.D., Director, Center for Western Weather and Water Extremes, Scripps Institution of Oceanography, University of California San Diego

INTRODUCTION

Chairman Napolitano, Ranking Member Westerman, and members of the Subcommittee, thank you for the opportunity to be here today to discuss water infrastructure policies and implementation of the Water Resources Development Act. My name is Marty Ralph and I am the Director of the Center for Western Weather and Water Extremes (CW3E) at University of California San Diego's Scripps Institution of Oceanography (Scripps).

I have worked as a weather and water scientist focused on understanding the physical processes that create extremes in precipitation ranging from flood to drought, and on advancing associated observations, predictions, water management and flood control applications and decision support tools. After 21 years of experience as a scientist, manager and program manager in NOAA, performing, leading and funding research aimed at creating practical impacts on weather prediction skill and user-decision making, I moved in 2013 to the University of California San Diego/Scripps Institution of Oceanography to create what is now the "Center for Western Weather and Water Extremes." I have published over 120 peer-reviewed scientific articles, and have developed programs on new science and technology and their application to solving practical problems. I have led many aspects of research on atmospheric rivers over the last 15 years, and provide input to water managers, and policy makers related to western weather and water extremes.

A key focus of my work these last several years has been to explore the potential for use of Forecast-Informed Reservoir Operations (FIRO) based on current and future atmospheric river prediction skill. I work closely with water managers, including with the US Army Corps of Engineers and related experts. A key role is as Co-Chair of the cross-disciplinary and interagency Steering Committee for the first FIRO project, at Lake Mendocino, and now also as Co-Chair of similar committees for two other reservoirs. Recognition: elected Fellow of the American Meteorological Society, awards from the Department of Commerce such as for "For comprehensive flood mitigation efforts in response to a severely weakened Howard Hansen Dam project with the potential of catastrophic flooding," awards from NOAA and else-

where. I have a B.S. in Meteorology from University of Arizona, and a Ph.D. in Atmospheric Sciences from UCLA.

This testimony is organized into the following brief sections: 1) What is FIRO? What role do ARs play? What have we learned so far, primarily from the Lake Mendocino experience? 2) What is happening now and what is on the near horizon for FIRO in terms of weather, hydrology, and associated science? 3) Perspectives on the need for improved predictive skill on time scales of reservoir and downstream characteristics. Appendix) Regional water agency statements on the impacts of atmospherics, and FIRO.

1) What is Forecast-Informed Reservoir Operations (FIRO), what role do atmospheric rivers play and what have we learned thus far?

A group of scientists and engineers from local, state and federal agencies, including representatives from the U.S. Army Corps of Engineers, has been developing a proof-of-concept demonstration project for Forecast Informed Reservoir Operations (FIRO) since 2014. Last year, the group, the Lake Mendocino FIRO Steering Committee, filed a request with the Corps to allow a deviation from its established flood control operating rules. The deviation request was supported by a Preliminary Viability Assessment, which contained detailed modeling, analysis and scientific research. The assessment demonstrated that FIRO can provide water managers the information they need, with adequate lead time, to selectively retain or release water from reservoirs. The assessment identified atmospheric river (AR) type storms as the primary storm type that can cause flooding and provides up to 50% of the precipitation annually. It showed that there is enough skill in AR forecasting that it could enable FIRO, and that improved AR predictions could increase benefits. Based on the research findings and USACE review of the major deviation request, the request was approved in November 2018 by the US Army Corps of Engineers' South Pacific Division.

The major deviation allowed additional water, up to 10% of flood storage capacity and at the discretion of the operations staff, to be stored in Lake Mendocino during this winter's rainy season to improve water supply reliability and environmental conditions in the Russian River, while continuing to not only ensure but also improve flood management capacity of the reservoir. The decision would allow the Corps to use modern weather prediction technology to operate the reservoir with more flexibility to store more water when no major storms are forecasted and order releases ahead of major storms when forecasts indicate the possibility of significant reservoir inflows.

Per the major deviation the reservoir was operated during late 2018 to early 2019 following the FIRO method. Based on the streamflow forecasts from NWS, on new AR-forecast tools developed by FIRO, and on a new decision support tool, also developed through FIRO, the reservoir held over 10,000 acre-feet of extra water through much of the winter. A clear demonstration of the FIRO concept in the real world.

"The ability to leverage newer technology and knowledge base as it pertains to weather forecast enhances our ability to safely deliver the multiple missions at Lake Mendocino," said Nick Malasavage, chief of Operations and Readiness Division for the U.S. Army Corps of Engineers San Francisco District. "In particular, the steps we are now taking to further develop and incrementally implement the FIRO concept adds an additional tool to maintain our primary responsibilities for flood risk management."

Under the approved request, a maximum of 3.8 billion gallons (11,650 acre-feet) of additional water could be stored in the reservoir between November 1 and February 28, which is enough water to supply approximately 97,000 people for a year.

Lake Mendocino, located near the city of Ukiah, is operated jointly by the Corps and Sonoma Water. The Corps manages the flood control operations at the reservoir, or the water in what is referred to as the "flood pool." Sonoma Water manages the water stored expressly for water supply, known as the "conservation pool" and is also responsible for maintaining minimum in-stream flows in the Russian River below Lake Mendocino.

Studies show that about 50 percent of the rainfall and 80 percent of the floods in the Russian River watershed are due to atmospheric rivers—long narrow bands of warm, moisture-laden air that carry huge amounts of water vapor propelled by high winds.

"We know that a majority of our rain each year comes from these atmospheric rivers," said Sonoma Water Chief Engineer and co-chair of the steering committee Jay Jasperse. "Because we now have the technology to better predict the timing and intensity of these storms, it allows us the opportunity to manage our water supply more efficiently and maintain flood management capacity in Lake Mendocino."

A dramatic illustration of the potential benefits of FIRO occurred in December of 2012 when a large atmospheric river storm filled the available water supply space in Lake Mendocino and filled about 25,000 acre feet of the flood pool that is normally kept empty to take the crest off of floods. Operating under the Corps procedures, which dictate that water in the flood pool be released as soon as possible to make room for the next storm, dam operators followed the operations rules and released the water from the flood pool, even though no storms or flooding was forecasted in the near future. But no additional storms occurred, and the next winter was the beginning of a severe and extended drought. If improved forecasts had been available and used in 2012 and atmospheric river storms were not predicted to occur, and operation rules were more flexible, the water that had been released could have been put to beneficial uses just as the region entered a drought.

The FIRO effort that has led to this approval by the Corps is the result of a highly collaborative effort between engineers, physical scientists, biologists and forecasters. Sonoma Water and the Corps are to be commended for their leadership and innovation on FIRO at Lake Mendocino, which is setting the stage for further exploration of this promising approach.

"This collaboration will have far-reaching benefits for the resiliency and reliability of our water supply system in the face of a changing climate," said James Gore, Chair of Sonoma Water's Board of Directors. "Improved forecasting provides us with the ability to store more water and still maintain the flood protection benefits of our reservoirs. This is another great example of the benefits of a multi-agency partnership that addresses our most challenging issues."

The success thus far of the FIRO effort is due in large part to the formation of the FIRO Steering Committee and the development of its internal culture and processes which has successfully brought together groups with often competing missions and interests, but with a common vision that better water management operations are possible through cooperation and advances in science and engineering. Additionally, with the connection and interaction of FIRO Steering Committee members and staff from the respective organizations who are engaged in the research and operations aspects of water management, the FIRO effort has eliminated the gap that can exist between research that investigates and makes scientific advances and operators who need tools that are ready for application to real world problems with requisite reliability and assurance. Research, operations and regulatory perspectives have blended in every element of the FIRO effort to produce science to inform policy and bring about improved efficiency in water management for the simultaneous benefit of flood risk management, water supply and ecologic concerns.

The Lake Mendocino FIRO Steering Committee consists of representatives from Sonoma Water (Sonoma County Water Agency), the Center for Western Weather and Water Extremes at Scripps Institution of Oceanography (Scripps), U.S. Army Corps of Engineers (Corps), National Oceanic and Atmospheric Administration (NOAA), U.S. Geologic Survey (USGS), U.S. Bureau of Reclamation and the California Department of Water Resources (DWR). The deviation request was submitted on behalf of steering committee members from Sonoma Water, Scripps, the Corps, NOAA and DWR.

2) What is happening now and what is on the near horizon for FIRO in terms of weather, hydrology, and associated science?

As an atmospheric scientist, I will restrict my comments here to primarily the implications for weather and streamflow conditions.

The first Full, Viability Assessment (FVA) for FIRO is underway at Lake Mendocino. A second Major Deviation Request to USACE to operate the dam following FIRO this coming winter is in preparation. Scientific developments are underway to improve AR forecasts for the region and to assess the potential benefits of such improvements. Better observations offshore and onshore are aiding in understanding how major storms behave and how their precipitation runs off into the rivers and reservoir. Computer models for weather and hydrology are being improved and a decision support tools using that information are being refined.

Two new FIRO efforts have begun on systems that are very different from Lake Mendocino, and will offer lessons that extend and complement what Mendocino is teaching us. These include meteorological and hydrological conditions that differ from coastal northern California. Fewer storms each year produce more of the precipitation. Mountains are tall enough to capture some precipitation as snow, which means a delay in the runoff until it melts, some of it days or even months after the storm. The watershed is highly urbanized, meaning more of the rain runs off into rivers than soaks into the ground. Although these differences with the Russian River may serve to complicate matters, the closer proximity of Prado Dam to the ocean, relative to Lake Mendocino, allows flow to move past flood-impact areas and

reach the ocean faster. Thus, forecast requirements will likely be less stringent in terms of lead times. Maybe 1–2 days shorter. Sierra Nevada reservoirs involve additional hydrometeorological challenges. These watersheds are high enough that a large fraction of their area can receive snow. Yet AR storms are often warm and can melt the snow, thereby adding to flood potential. Thus, snow prediction, and snow-melt prediction are critical to FIRO in such areas, and require different meteorological and hydrological forecast skills and tools, and supporting science.

3) Perspectives on the need for improved predictive skill for atmospheric rivers to support improvements in water supply reliability, flood risk mitigation capacity and ecological benefits through FIRO

The viability of FIRO for a given reservoir hinges on adequate predictive skill for storms and streamflow conditions that represent challenges in operations for either flood control or water supply, or for ecological concerns. In much of the US West, this means atmospheric rivers. ARs are the storm type that provide much of the annual water supply in a relatively few storms each cool season, and that can create flooding when they are too strong and impact an already saturated and vulnerable watershed.

The FIRO viability assessment at Lake Mendocino has shown that AR forecasts with 3–5 days lead time are key. Analysis has shown that current forecast skill is adequate for initial FIRO testing, and that future enhancements in skill could yield even greater benefits. Current estimates are 20,000 AF net increase in water supply reliability in about half the water years, and that additional benefits could accrue based on better forecasts.

The requirements for better predictions for FIRO boil down to better AR landfall predictions and of forecasts of how much precipitation will be created by ARs and whether it falls as rain or snow (in the case of mountainous watersheds with high terrain). Tools and methods to improve upon these include:

- Better observations of ARs and their precursors over the ocean and coast
- Better weather forecast models tailored to AR and west-coast precipitation forecasting
- Better skill in precipitation and streamflow prediction
- Decision support tools tailored to each watershed's needs
- Better scientific understanding required to make the improvements listed above.

Although FIRO has been developed for the West Coast thus far, the potential exists for it to be useful elsewhere, such as the Great Plains or eastern U.S where ARs can also cause significant flooding events such as in Nashville in May 2010 and in the Washington, DC Area in July 2018. However, the skill of extreme precipitation forecasting is best in the West Coast because ARs have some valuable predictability already. In the Great Plains, large thunderstorms, or clusters of thunderstorms are key to flooding, and yet are much harder to predict than ARs. Tropical storms and hurricanes are another cause, and they may have some of the predictability needed, but how that predictability relates to the lead times that are required by FIRO in those regions remains to be assessed.

Mrs. NAPOLITANO. Thank you. Thank you for your testimony.

That sounds very promising, and I hope that you develop it further to help anywhere in the United States eventually.

Thank you, everybody, for your testimony.

We will recognize myself for 5 minutes and the questions that I have for many. I think we will try to expedite this since we have been here almost 3 hours.

Mr. Berginnis, this year's floods have devastated communities across the Nation. How do we help ensure that the Corps helps to rebuild and how do we build it better?

Do you think the funding is sufficient to do so?

Mr. BERGINNIS. I do not think the funding is sufficient, and again, as outlined in our testimony, and it was very interesting to hear the comments about how we can bring this to bear on all communities, not just with communities with authorized projects, and the Corps has so much expertise.

But it is unable physically to go out into communities to help with planning and doing projects, even projects where a community might want to do it themselves.

So that is one aspect of it. The other is, you know, I was reading about a report that came out I think in the last week or so that used the example of if we use the option of seawalls, that across the Nation we are looking at about a $400 billion price tag when it comes to dealing with sea level rise.

And the intent of that study was not to say we need seawalls everywhere, but the intent of that study was to start getting our arms around the magnitude of the flooding problem that we face with the future conditions that we are going to be dealing with.

And so the $100 billion backlog that we talk about is really small compared to just what we are going to be facing on our coasts.

Mrs. NAPOLITANO. Mr. Brockbank and Ms. Hill-Gabriel, we hear more reports of coastal beach closures because of the algae bloom. What are the ecology and economic consequences of algae blooms?

What are your recommendations for long-term solutions?

How does it affect communities and tourism and fishing and the lost revenue?

Mr. BROCKBANK. Certainly the economics of algae bloom are devastating to local communities who rely on beach tourism as a primary source of their economic wellbeing.

ASBPA does not work on water quality issues, but we are very actively trying to support these communities that have beach tourism as an economic base.

And so I think whatever the Corps is able to do to ensure that the water quality is of a sufficient standard to maintain that base, it is absolutely critical.

Ms. HILL-GABRIEL. And thank you for that question.

I think another important factor to think about is the need to coordinate between local government, State government, and the Federal Government. There are many things that are outside of the Army Corps' mission that they do not have control over that often contributes to the algae blooms.

So looking at where, for example, there are State water quality issues that need to be addressed that end up having a confluence with the water management issues that the Army Corps is responsible for, we have to look at these things comprehensively.

Almost in every case where we see a massive algal bloom problem there is not one silver bullet solution. So ensuring that we bring the right people together to talk about each different decision maker or entity's responsibility in trying to address the problem is critically important.

And I just have to share that, you know, I saw Congressman Mast put up the pictures of the algal bloom in the St. Lucie Estuary in Florida, and I remember that about 3 years ago I went when it was particularly bad, and went out there for the first time—I'd lived in Florida at the time, but not right there—and I parked my car and I opened the door, and I was across the street from the water, and I thought, oh, I must have parked next to a dumpster. I was not parked next to a dumpster. This is something that, you know, so far away, the smell just really overcomes you, and it truly

is something that you physically feel in your eyes, and immediately makes it challenging.

So of course people are not going to want to come to these destinations that are world-renowned tourist destinations when that is the impact that they are feeling. And so the economic damages that occur as a result of that are clear.

Mrs. NAPOLITANO. Well, do you find that the agencies don't always talk to each other? Because when I was in State government I had to bring them together to talk to each other and cooperate with each other. But doesn't that sound like it would be the norm? Should be?

Ms. HILL-GABRIEL. I think we wish it would, but that is certainly always a challenge, is a need for someone to take a leadership helm and make sure that those people are brought together to the table at the right time to have the right discussion, and that everyone is willing and ready to address their contribution to the problem.

Mrs. NAPOLITANO. Dr. Ralph, one of the sites being considered by the organization is Prado Dam, which is in my region. I know that all sites are different, as you explained. What are the lessons learned from Lake Mendocino and how can you apply those to other reservoirs like Prado?

Mr. RALPH. One of the calculations that needs to be made involves how the reservoir is operated. If it is operated such that it may need 2 or 3 days' lead time, we can do better at forecasting 2 or 3 days out. If it requires 7 or 10 days, that is going to be a different story. It is very tough to get these storms right 7 or 10 days out. So a lot of it depends on the character of the watershed and the dam itself.

Mrs. NAPOLITANO. Would that require cooperation of the agencies to be aware of it?

Mr. RALPH. Oh absolutely and we have been very well-received by agencies wanting to discuss this.

Mrs. NAPOLITANO. Thank you. Mr. Westerman, you are recognized.

Mr. WESTERMAN. Thank you, Madam Chair. For a while, the witnesses had us outnumbered three to one, but thanks to Ranking Member Graves, we got it down to two to one, now. And I want to thank the witnesses for your patience and also for your very important testimony, for presenting it to the executive committee of the committee, but more than that, getting it on record because it is important issues that you have talked about.

Mr. Innis, you talked about the inland waterways and the navigation and commerce on those waterways. Can you elaborate a little bit more on how the river closures have affected industries that rely on products that move up and down the river?

Mr. INNIS. Sure. This year has been extreme with the flooding that we have seen. We have seen millions of dollars of cost to us, and also delays in projects all over our system because we can't get the products there. And so that has had major impacts on what we have been able to do, and it has really caused delays and put more trucks on the road as well as finding alternative methods to get there, which is not our preferred method.

You know, and the delays of getting to, let's use St. Paul as an example, we were almost 3 months delayed getting there from

when we would normally get there, and the cost and impacts to projects up in that area and further north have been huge for us. And modernizing the system is going to be critical because if those are modernized, we can recover quicker from a flood event to reduce the costs, and that 75/25 split is going to be crucial to being able to do that.

Mr. WESTERMAN. Thank you for that. Many of you mentioned in your testimony this concept of natural infrastructure. I heard words like designing with nature. I thought of the lyrics to a song that said I fought the law and the law one. You know, at some point we are going to say, I fought nature and nature won. And I think we are seeing that in a lot of places now.

So the question to the panel is how is the Corps implementing provisions from WRDA 2016 and 2018 to consider natural and nature-based features when studying certain projects; and as a followup, is the Corps or non-Federal sponsors, are they acting as barriers to considering natural and nature-based designs?

Mr. BERGINNIS. One thing that I will mention is that we do have some concern that the Corps has not yet done rulemaking from some of the WRRDA 2014 or also WRDA 2018 related to some of the natural infrastructure. The Corps initiated some rulemaking in February 2015 but we've not seen any proposals 4 years later. So by not having the rulemaking, that is problematic.

Ms. HILL-GABRIEL. Thank you. I will add that I think the direction was very clear that the Army Corps should be considering, or must consider, natural infrastructural alternatives in projects like flood risk reduction, and yet it is very infrequent; almost never do we see a natural infrastructural alternative make it all the way through the planning process and get the same level of analysis as some of the more traditional routes for infrastructure.

And I think an issue that a number of folks have mentioned today is the cost-benefit ratio analysis. It seems to be one hurdle to being able to fully analyze the benefits. And of course Secretary James mentioned, himself, that he doesn't think they are able to fully interpret the benefits that some of these types of projects provide, or options for projects provide.

So I definitely think that as we continue to implement those provisions that the committee has made clear, we need to look into that more and help them be able to do the right analysis.

Mr. BROCKBANK. If I may, I will just be real quick. WRDA 2016, section 1184 required natural features to be considered in feasibility studies. WRDA 2018, section 1149 allowed for natural and nature-based features to be included in aquatic ecosystem and flood risk management projects.

These were provisions that we strongly supported and am pleased were included, but they weren't requirements to do natural infrastructure, and so I think we need to change the framework for how the Corps decides what projects to do rather than just sort of saying, you know, consider this or you are allowed to do this. I think there needs to be sort of a fundamental switch about how the Corps plans its projects rather than just asking them to consider the project.

Mr. WESTERMAN. In my remaining time, Dr. Ralph, we have talked a little bit about innovations and using modern technology.

During the flooding in Arkansas I was out on the river a lot and met a gentleman in his local community. He had developed a sensor that was relatively low-cost, you could put it on a metal fence post. He was putting these out on private property and they were giving real-time water level measurements in one hundredth of an inch increments, and you can do all kinds of neat stuff with that kind of data, and he developed this for the irrigation industry.

And I said, that's pretty cool technology, have you talked to the Corps or anybody about using this for monitoring river levels. And he said, you know, the Corps is not interested in talking to somebody like me about new technology.

But do you see a hinderance with the Corps in accepting new technology and getting out on the cutting edge of things that could be very beneficial in monitoring current conditions and changing conditions?

Mr. RALPH. Actually my experience is just the opposite. They have been very open to exploring new approaches. We work directly with the research side of the Corps, which is the Engineer Research and Development Center is the lead of that, and we are actively engaged in testing new methods with them.

Mr. WESTERMAN. I yield back, Madam Chair.

Mrs. NAPOLITANO. Thank you. Ms. Mucarsel-Powell.

Ms. MUCARSEL-POWELL. Thank you, Madam Chair.

Ms. Hill-Gabriel, it is great to have you here with us this afternoon. As you know, I feel like sometimes I sound like a broken record because all I talk about is the situation that we have in my district, the Everglades is part of my district, and we have been working on Everglades restoration now for two decades. And I just feel like we have so much to do, and no one seems to have a clear answer on what are the much necessary steps to avoid the catastrophe that we saw last summer, and to protect our ecosystem, which is dying, and also the livelihood of so many, millions, of Floridians that depend on this ecosystem for water quality and their livelihood, really.

So from your perspective, from all the work that you have done, what is it that we can do to speed up the restoration process right now?

Ms. HILL-GABRIEL. Thank you, Congresswoman.

I think the first thing is, again, a common theme we have heard today, is that for all the success this committee has had in getting new projects authorized, we need help working with colleagues in the Appropriations Committee to make sure those newly authorized projects get funded.

The amount of progress that has been able to be made by having the ability to authorize new projects get back on a regular cycle is clear. When you have that level of certainty it really makes a difference because it filters all the way back down to beginning new planning studies, and every step in the process it takes to bring a project up to Congress.

When the funding is uncertain, and we have seen the Army Corps funding at times can go up and down, it makes it very difficult not only for the Corps to plan ahead with how much progress can be made in any given year, but it also makes it difficult for the non-Federal sponsor to be able to budget accordingly.

Where we have seen a lot of progress in the Everglades has been when the non-Federal sponsor has taken the lead and said, well, we will make sure we have the funding in place. So if we are able to get that $200 million in place this fiscal year and future fiscal years, that will make progress happen much, much faster.

And as the chairwoman noted in her opening remarks, additional appropriations challenges, like limiting the number of New Starts, can also be a barrier to making progress, not only on the Everglades but on all of the projects that we are talking about here today.

The last thing I will add is I think that when we have these massive long-term programs, it is easy to find issues along the way that can divert us off of the course of getting projects done and getting the next projects ready. And so really maintaining that focus and keeping our eye on what the ultimate goal is, and continuing progress is key.

Ms. MUCARSEL-POWELL. Well, I was on a mission when I started in January requesting that funding for the Everglades and testified in front of the Appropriations Committee requesting those $200 million. I just worry that now that it has been approved, that the $200 million will help complete some of the planning, not necessarily complete the project. So it will delay the restoration efforts. So that is a concern of mine.

Another question that I wanted to ask you, you spoke about the marshy areas within the lake that could help in filtering some of the toxicity of the water. Can you talk a little bit about that and just explain what else we can be doing to just improve the overwhelming toxicity that we find in the water currently on Lake Okeechobee.

Ms. HILL-GABRIEL. That's right. Often we talk about Lake Okeechobee in terms of the source of these discharges that go out to coastal estuaries and cause toxic algal blooms, but the lake, itself, actually has incredibly important habitat. And even if you are not concerned with birds or other wildlife that rely on the lake, it also contains when it is healthy up to 150,000 acres of marsh that acts as a natural filtration system. So when we hold lake levels too high for too long, or too low for too long, some of that marsh dies out and so the natural water quality treatment is no longer there.

And to put it in perspective, the State of Florida south of Lake Okeechobee has built about 65,000 acres of manmade treatment marshes because we found that despite every technology attempted, those treatment marshes were the best way to actually remove the nutrients, that nature won. We couldn't figure out a better option other than nature, replicating nature. So building manmade marshes costs the State over $2 billion, but meanwhile you have twice that amount in Lake Okeechobee itself if you just keep the lake healthy.

So it is important to also consider the habitat on the lake, itself, in the equation of trying to solve those water quality problems.

Ms. MUCARSEL-POWELL. Thank you so much. I have run out of time, but maybe I will ask you some questions after. Thank you.

Mrs. NAPOLITANO. Mr. Graves, you are recognized.

Mr. GRAVES OF MISSOURI. Thank you, Madam Chair.

My question is for Mr. Waters, and obviously we have demonstrated just how bad the flooding has been—some of the worst on record. Can you expand a little bit, and I apologize for missing all of the witnesses' opening testimony—I had another commitment—but can you expand a little bit on how this has affected the livelihood of our communities and our farmers and, you know, all of our area, the businesses throughout? And you can focus specifically on the State of Missouri because it is the same whether it is Nebraska or Iowa or Kansas or farther downstream on the Mississippi.

Mr. WATERS. It has been incredible, this event. Number one, I sat on the highway commission in Missouri and at one point we had over 407 roads closed due to the flooding. Some of those were major interstate highways. I–29 that runs up through Missouri and Iowa was closed for numerous days. That alone is a huge economic impact.

The farmland that was flooded, in Missouri one-third of the crop produced in the State is produced in the 100-year flood plain. We have got a massive amount of that flood plain under water now. That is going to have a huge impact on the State's economy because agriculture is the number one industry in the State, and it is not going to end this year because, as I mentioned in my testimony, those levees are going to sit open. The Corps is saying that they probably won't get the levees repaired for 2 years. I think it is probably more like 3 to 5 years.

And so this thing is going to drag on a long time, and it just trickles through the whole economy of the State. Not just the State, but when you put Kansas, Iowa and Nebraska in there, the whole Midwest, it really will affect food production and trickle through the United States economy. I really believe that.

Mr. GRAVES OF MISSOURI. Can you, just to change gears for just a little bit real briefly, talk to me a little bit about realignment and setbacks when it comes to the levees and how that is going to impact property owners and some of that farmland?

Mr. WATERS. Sure, I will talk about a levee breach on my property. The hole that was created when the water came over the levee and breached, is 51 feet deep. So filling that whole would be very difficult, so what we feel like we are going to have a realignment and ring that hole. So that can be expensive as well, but some of those realignments are, you know, they are necessary; there is no other way to fix them.

As we heard General Spellmon say this morning, just in the levees they have been able to look at, $1.9 billion in levee repairs. That is——

Mr. GRAVES OF MISSOURI. That is a preliminary estimate.

Mr. WATERS [continuing]. Just a tip of just a few of the levees that they have, you know, had a chance to get in and look at. That number is going to continue to increase.

Mr. GRAVES OF MISSOURI. Thank you, Madam Chair.

Mrs. NAPOLITANO. Thank you Mr. Graves. Mr. LaMalfa.

Mr. LAMALFA. Thank you, Madam Chair. My apologies for my absence here, multiple things at one time, so I appreciate Madam Chair having this hearing and this panel for being here.

I wanted to zero in on the issues revolving around Oroville Dam in northern California which suffered a spillway breakage a little over 2 years ago, and since then has been rebuilt and is well functioning.

The reconstruction of it, which, you know, we understand there are certain issues with how lake levels have to be maintained on that, but indeed, for 2 years the lake level of Lake Oroville was kept very low in phase with this construction, and it was a risk-averse strategy, and again, it is understandable part of it here, but I think the net effect was the local economic issues faced with that, and I will be addressing Mr. Ralph with a question on that here in a moment, it hurt the local economy on the recreational side and tourism side, as well as the water supply issues for the State of California.

The State has yet—does not contribute any real significant funding to Oroville to compensate for county's responsibility to maintain roads, law enforcement, fire, et cetera. So the county, Butte County, calculates approximately $10 million a year of cost to them for providing services that they have little authority to be part of.

So with that, the dam—two economic problems that we need help with. We can fix through the FERC relicensing process and see that DWR is a bigger partner going forward on what its costs of the dam to the community are; and then also looking at adding in more, directing to Mr. Ralph, looking at the risk and economic impacts when we do this, the forecasting model for how the lake level is maintained. Again, it is a different situation when the spillway is being repaired. I thought it was a little conservative, but—on low levels—but nonetheless, we are through that and we have a great water year this year, 2019.

So Mr. Ralph, I understand you are working on a forecast model with the State in the hope of updating the 1970s era Army Corps manual for operations of Lake Oroville as well as New Bullards Bar nearby—they kind of work together. Do you expect this update to be completed at what point?

Mr. RALPH. We are working with the Yuba Water Agency and California Department of Water Resources in a combined effort on the Yuba and Feather that will involve both New Bullards Bar and Oroville. We are in the phase now of beginning to develop the workplan to lay out what is needed in terms of our analysis and science to address the issues. We have a target timeline such that our report will generate the inputs into a potential water control manual update in the order of 3 years or so from now.

Mr. LAMALFA. OK, when was this first started or proposed?

Mr. RALPH. We just began the work together in May.

Mr. LAMALFA. Of proposing the idea of changing the manual or——

Mr. RALPH. I believe that Yuba Water Agency has already been envisioning a change in the water manual associated with a revision to their release facilities from New Bullards Bar, so we are working with them very closely and coordinating the timelines. Our committee includes a representative for Oroville Dam from DWR.

Mr. LAMALFA. OK, so basically it is a 3-year process from initiating, being this year, is what you are hoping for?

Mr. RALPH. Right. It has been a 5-year process on Lake Mendocino and we are accelerating that as we learn along the way.

Mr. LAMALFA. OK, kind of use that model as a way to move a little quicker on this one, hopefully, right?

Mr. RALPH. Right, we are learning things we don't have to reinvent, but there are new challenges on Oroville, in particular the High Sierra in the snowpack is a big technical issue and we have got to address that.

Mr. LAMALFA. Yes, I have noticed, I have looked at a lot of numbers on that where there, you know, with a big snowpack up there, there is a lot of fear about that snowpack melting all at once, but every number I ever watched on CFS input has been pretty conservative, I mean pretty low numbers. It hasn't been the rush of water coming into the lake. I know that farther down, more in central California, those rivers really rage when snow melt happens, but up in our area it seems it is not as big of a concern, so when I watch how they are managing lake level, it seems like there might just be a little bit of overemphasis on that.

So I hope as you are modeling this that—what kind of improvements do you think we can allow to keep the lake fuller longer into the year so that we have that water supply issue for the rest of the State as well as the local economic and tourist issues? Is there a way to aggressively look at this model and keep more water at a longer period and still have the margin of safety that is reasonable?

Mr. RALPH. Yes, our effort is going to look both at increase in water supply reliability in a way as you are envisioning there, but also flood control mitigation capacity through prereleases. This is aligned with the new release structure that New Bullards Bar is envisioning that will allow them to make releases at a lower water level in the reservoir.

Mr. LAMALFA. OK, because when I noticed——

Mrs. NAPOLITANO. Thank you.

Mr. LAMALFA [continuing]. At Oroville we have a lot of capacity through the Hyatt Powerplant to maintain, and then the spillway itself is designed for a lot of ability to spill safely within the river system, so it looks to me like we can certainly be a little more aggressive on keeping the lake full longer and still have that margin of safety. So please look into that, and I will yield back, Madam Chairman.

Mrs. NAPOLITANO. Thank you, Mr. LaMalfa. We are going to go into a second round, very brief, but to the panel, all of you, why is it important that Congress continue to enact WRDA?

Mr. WATERS. Well, I would just say we have got a lot of problems out there, Madam Chairman. We have got flood control structure all over the country that needs improvements, needs to be put back where it has been damaged, there are problems across this whole country, and as I said in my testimony, wake up in the morning, turn the TV on, you will see it flooding somewhere in the country nearly every day.

Mr. BERGINNIS. I very much agree with Tom in terms of the problem, and when you also add sea level rise, it is something that will be among the national priorities I think we are dealing with in this century. We need to have the full expertise and the re-

sources of the Corps of Engineers, but also take a broader flood plain management approach that includes flood control. Thank you.

Mr. INNIS. The biggest thing that we have seen is the impact of WRDA of being hitting every 2 years. I mean the impact that we have seen to the inland waterway system has been huge. We have started to see projects completed and move forward, and having that continue is going to be critical so that we can get these 15 priority projects done, and the cost share will be the next thing to hurdle. Thank you.

Ms. HILL-GABRIEL. Water is life's most critical element, and I think as the change in climate means we are going to see stronger storms, sea level rise, flooding in some places and drought in others. There is probably no more important issue than advancing water infrastructure.

Mr. BROCKBANK. The Army Corps of Engineers is our Nation's most critical agency in addressing many of the water challenges, but certainly the coastal challenges we face, and they need to have the full tools at their disposal and have the authorization to implement projects, and that is done by WRDA every 2 years.

Mr. RALPH. I see WRDA as providing a venue for dialogue about innovation and new approaches that could be helpful in the long term.

Mrs. NAPOLITANO. There seems to be the topic for everybody that we need WRDA, we need the resources and we need your expertise to be able to make sure that we address all the issues, and I would like to ask my colleague, Mr. Westerman, for his comment.

Mr. WESTERMAN. Thank you, Madam Chair, and I really look forward to working with you and the committee on getting another WRDA in 2020. It is something we definitely need to do. Your testimony is extremely valuable in helping us prepare for that, and I would like to yield the rest of my time to the ranking member of the full committee, Mr. Graves.

Mrs. NAPOLITANO. He has a full 5 minutes. I recognize Mr. Graves.

Mr. GRAVES OF MISSOURI. Thank you, Madam Chair.

Just real quick, I was reading through your testimony, Mr. Waters, and you talk about the long- and short-term needs necessary to get folks back on their feet and prevent future events. So from your perspective, can you go into a little bit more depth on how the Corps is going to balance, you know, different purposes like fish and wildlife, obviously to the detriment of flood control in many cases, but that as well as, you know, some of the potential proposed solutions that have been offered up, obviously from your perspective?

Mr. WATERS. Well, currently the Corps is trying to balance eight authorized purposes with the Missouri River flood control system, and they are trying to balance all of those equally. Well, they are not equal. This system was built for flood control, and so we have to set a priority on flood control. And when we do that we are not tossing away the other authorized purposes.

When the system was built for flood control, all these other purposes and all these other benefits of a system came about. So they will still be there, but to manage this system, to protect lives and property, it has to be managed for flood control. And so we have

got to get back to that, and I think one of the first places that we can start is with the dike notching that I talked about. If we can get these dikes fixed so the water flows downstream. Right now with all the notched dikes, as the water comes down the river it hits those dikes and swirls; and so it is swirling its way down the stream.

If you look at the Illinois and the Ohio River, those riverbanks are straight and smooth and the water flows right down the river. But we have been doing some of these, I call them experiments, these projects that we have done have damaged the flood control system, and we are seeing results of it now. We are seeing more flooding more often.

Mr. GRAVES OF MISSOURI. Thank you, Madam Chair.

Mrs. NAPOLITANO. Thank you, Mr. Graves. The Chair now recognizes Mr. Graves of Louisiana.

Mr. GRAVES OF LOUISIANA. Thank you, Madam Chair.

I want to thank all of you for being here today and providing your input. We talked in the first panel a little bit about the backlog of the Corps of Engineers, and I want to state for the record, unequivocally, that I could not more disagree with Secretary James' comment that the backlog only consists of projects that have been partially funded. Congress doesn't earmark projects. I couldn't disagree more with the way that he categorized that. If a project has been authorized by this committee, by this Congress, it is a backlog project, period. There is a way to take projects out of the authorization process through a deauthorization. If a project is authorized, it is an authorized project and it is part of the backlog, period.

But moving on, you all have experience in water resource projects in some degree. Let me ask you, just show of hands, how many of you are satisfied or think that the existing water resources project development and delivery process is adequate or corresponds with the urgency of the projects that you have worked on.

Madam Chair, I just want to let the record reflect that no one's hand is up right now.

So you, I'm guessing, have worked on water resource projects outside of this Corps of Engineers confine, and look, I am not beating up on an individual. It is a process. I think the organizational structure is flawed. Congress has some culpability. I do think you have people in the agencies and OMB that have culpability.

But looking across your entire portfolio of experience, can you talk about giving you a magic wand, what are some of the things that you would change based on how you have seen project development and project implementation occur working with a county, a parish, a State or a not-for-profit or other groups. And Ms. Hill-Gabriel, feel free to throw some shout-outs for Louisiana.

Madam Chair, for the record, I want to make mention of a National Geographic article that said that the Florida Everglades was a petting zoo compared to the ecological productivity of coastal Louisiana. I would never say those things, I am just quoting someone else, but regardless, if I could get your all's feedback on that question I would appreciate it.

Mr. WATERS. Well, I would just say there is a lot of bureaucracy involved in every project, even some—you know, I have been talk-

ing about levee repairs, but some of those repair projects drag on for a very long time as you deal with regulations and rules within the Corps of Engineers, and even beyond the Corps. You know, we have to do environmental studies, we have to gather easements and property rights, so there is so much bureaucracy and the timetable just for putting one levee back together is extremely long and so that is why——

Mr. GRAVES OF LOUISIANA. But Mr. Waters——

Mr. WATERS [continuing]. I said maybe 3 to 5 years to get it done.

Mr. GRAVES OF LOUISIANA [continuing]. Is there a project that you have worked on outside of this Corps of Engineers Federal confine that you said, you know what, that worked.

Mr. WATERS. Absolutely, absolutely.

Mr. GRAVES OF LOUISIANA. Which one? Can you give——

Mr. WATERS. Through the NRCS. You know, we have projects and their water——

Mr. GRAVES OF LOUISIANA. Another Federal agency?

Mr. WATERS. Yes, but as a farmer I can go to the NRCS, they can design my project and give me the plans and then I can go outside and find my own contractor to build it and then get reimbursed for that for the cost share, whatever. So allowing me to do the contracting and taking care of a lot of that stuff that the Corps does on the Corps water project saves a tremendous amount of money.

Mr. GRAVES OF LOUISIANA. And Madam Chair, going back to the dialogue we had with Secretary James earlier, this 1043 process largely, well to some degree, provides for that. The Corps wrote 149 pages of guidance so I haven't had a chance to go through it all, but I am not sure that it is efficient as NRCS, but it is designed to mimic that process where you can use the efficiencies of your own contracting and things along those lines. And so I do think making sure that we prevent that authorization from expiring is very important.

Mrs. NAPOLITANO. When you are finished reading it, let us know.

Mr. GRAVES OF LOUISIANA. [Laughter].

Yes, ma'am, I will send you the CliffsNotes. Any others care to comment on this?

Mr. BERGINNIS. So another thing on adequacy, I think, is that, and Derek had mentioned this earlier, is that for natural infrastructure, or for nonstructural, the approach is incremental and it is as if the sponsor desires it as opposed to being an automatic part of project development or repair. For example, in Public Law 84–99, why isn't it that we don't, as a nation, have a rapid buy-out program for people that want to just get the heck out of harm's way.

Mr. GRAVES OF LOUISIANA. Or better yet, why don't we look at the Community Development Block Grant Disaster Recovery Program, the Pre-Disaster Mitigation Program, the Hazard Mitigation Grant Program, the Corps of Engineers CG program, and instead of prohibiting each one of these from being able to comingle or work together, actually encouraging them to do so to where we can achieve some of these greater objectives like where it makes sense

buy-out, where it makes sense comingle funds and address the backlog of projects, and others.

Certainly a lot of efficiencies that I think we could incorporate, but we are going to address the rest of that through questions for the record, but I want to thank you, again, for being here today.

I yield back. Thank you, Madam Chair.

Mrs. NAPOLITANO. Thank you, Mr. Graves. Mr. LaMalfa for a short one.

Mr. LAMALFA. Thank you for another round here; try and do it half-time.

Coming back to Mr. Ralph since we have a little time. I just wanted to follow up on some of his Lake Oroville thoughts here. What kind of improvements do you think in the manual we can achieve that will allow us to keep more water in longer, especially in the summer months, so we have better recreation and tourism as well as what it means for agriculture in the southern part of the State and et cetera?

Mr. RALPH. Not being an expert on the water control manual process, I am an atmospheric scientist, I would like to get back to you on that if possible.

Mr. LAMALFA. OK, then I will follow up. Again, we have the ability for a mass amount of water to flow through the powerhouse and the newly rebuilt spillway. The spillway is large enough to overwhelm the levee system down below with its capacity.

So how far out do you think a forecast model could project when we would need to start releasing water to stay within that safe range of a full lake in the winter months but not too full for—so we have an orderly release but still, again, gearing towards a full lake at the end of the springtime? And how might that compare to the standard that DWR is already able to use working with Army Corps?

Mr. RALPH. I can't tell you numbers off the top of my head, but I can say that factors that come into play are how fast water can be released from the reservoir, what amount of water needs to be released, what the conveyance system is downstream, how far it needs to go, and each reservoir has its own particulars of that, and that is what our workplan has developed, is intending to quantify very carefully.

In the case of Lake Mendocino, for example, the number we came up with as a committee was 10,000 acre-feet of additional water supply reliability. Lake Mendocino is one-tenth the size of New Bullards Bar; it is a fraction of Oroville. And based on the release structure and the rates that have been allowable, it would take about 2 days to release that water. And then Guerneville is a town downstream that is flood prone. It would take about 1 to 3 days for that back edge of that surge of water to get past Guerneville. So you add the 2 days to get the water out of the dam, up to 3 days to get out of the way, that is 5 days. That gives us our lead-time requirement for adequate forecast skill so as to enable FIRO to work on Lake Mendocino. So we will have to go through those calculations very carefully with regards to the system.

Mr. LAMALFA. Makes perfect sense. You are either limited by the size of the spillway or the system below the levee as river to, in this case, it is the river structure that is going to limit how much

can go without unneeded damage. So I will be interested to see how a little more modernized look at what the snowpack release would be, so what is incoming to the lake is more realistic instead of the, you know, the more great level of concern maybe unneeded on that.

So with that, I will yield back and please keep me apprised as you are going along on that, we are very interested in that work as it unfolds. So thank you for that, and I yield back, Madam Chair.

Mrs. NAPOLITANO. Thank you, Mr. LaMalfa.

I ask unanimous consent that the record of today's hearing remain open until such time as our witnesses have provided answers to any questions that may be submitted to them by members of this committee in writing. I also ask unanimous consent that the record remain open for 15 days for any additional comments, information submitted by Members or the witnesses, to be included in the record of today's hearing. So without objection—no objection—so ordered.

I would like to thank—Secretary James left but he was here for a good portion of your testimony, and I thank him for that. And General Spellmon, thank you very much for staying. I recognize your presence and am thankful for it. And to the witnesses, thank you for your patience and we thank you for your testimony and I bid you good-bye. The subcommittee stands adjourned.

[Whereupon, at 1:42 p.m., the subcommittee was adjourned.]

SUBMISSIONS FOR THE RECORD

Prepared Statement of Hon. Eddie Bernice Johnson, a Representative in Congress from the State of Texas

Thank you, Madam Chairwoman.

I am pleased that the Chairwoman is holding this hearing today, as it allows us to review the Corps' implementation of the most recent Water Resources Development Acts (WRDA), enacted in 2014, 2016, and 2018.

On Monday, I held a bi-partisan roundtable discussion in my district to tackle the critical issues of flooding, flood prevention, and flood control. Federal, state, regional, and local stakeholders participated in a lively discussion. During the Roundtable, it was explained how $100 billion in flood damage was prevented by spending $2–$3 billion annually on a flood control system. It was clear that issues of flooding, flood prevention, and flood control must be addressed regionally using cross-functional teams with stakeholders at all levels of government, working together to protect Americans.

I am eager to hear from the Administration officials on the first panel to find out what is currently being done, as well as their initiatives to address flood related issues. I am also eager to hear from the stakeholders serving on the second panel today about the challenges faced and potential solutions. My interests are specific to how we, as a legislative body, can address flood damage prevention, which can save lives and millions of dollars. Perhaps the sharing of technology can be an avenue to guide drivers away from flooded areas and roads.

My district is facing economic growth. With that growth stirs development of rural areas, which may have served as natural flood barriers. Recently, my district is experiencing increased flooding. I am dedicated to addressing these issues on a short and long-term basis.

With this hearing, I join all the efforts to meaningfully address the nation's critical concerns surrounding flooding, flood damage prevention and flood control.

Thank you. I yield back.

Letter of July 9, 2019, from Doug Wheeler, President & CEO, Florida Ports Council, Submitted for the Record by Hon. Grace F. Napolitano

JULY 9, 2019.

Hon. PETER A. DEFAZIO
Chairman
House Committee on Transportation and Infrastructure

Hon. SAM GRAVES
Ranking Member
House Committee on Transportation and Infrastructure

Hon. GRACE F. NAPOLITANO
Chairwoman
Subcommittee on Water Resources and Environment

Hon. BRUCE WESTERMAN
Ranking Member
Subcommittee on Water Resources and Environment

RE: Water Resource Development Acts

DEAR CHAIRMAN DEFAZIO, CHAIRWOMAN NAPOLITANO, RANKING MEMBER GRAVES AND RANKING MEMBER WESTERMAN:

The Florida Ports Council represents Florida's network of 15 deepwater seaports. Seaports are one of the state's greatest economic assets, positively affecting every

region and every resident. Whether moving over a hundred million tons of cargo annually or millions of cruise passengers, Florida's seaports generate and support a vast array of commerce. These seaports are the gateway for shipment of goods into and out of Florida and link our state to vital international markets. Our seaports have a $117.6 billion economic impact on the state and account for more than 900,000 direct and indirect jobs.

The bi-partisan efforts of the House Transportation and Infrastructure Committee over the past several years have had a significant impact on seaports in Florida, as well as the entire nation. Starting with WRRDA 2014, the Committee made significant reforms to a stagnant and difficult navigational harbor construction and maintenance process. Florida was finally able to enter into a partnership with federal agencies to move forward on projects at all of our major seaport harbors.

Florida is the only state with navigational harbors bordering two major shipping lanes—the Gulf and the Atlantic Ocean. The Committee's efforts have enabled Florida to deepen the harbors at Canaveral, Jacksonville, Miami, and Tampa. In addition, the Harbor Maintenance Funds directed by the Committee continue to allow for navigational maintenance at all of Florida's seaports and our inland navigational rivers throughout Florida. These reform efforts have also allowed the Army Corps to repair navigational and water issues at Milepoint in Jacksonville, and the Comprehensive Everglades Restoration Plan that includes vital water projects around Lake Okeechobee and the Everglades.

But, as you all know, the work is not done. The navigational deepening project at Port Everglades in Ft. Lauderdale, Florida has experienced well over 20 years of reviews and discussions. That port is a vital fuel and cargo seaport for Florida's growing population, and issues must be resolved to allow that project to move forward. PortMiami will need additional navigational deepening to allow for additional larger cargo vessels to safely transit and offload at the port. And, even absent navigational hazards caused by hurricanes, Florida has ongoing maintenance and operations needs at all of our harbors. We also continue to work with Congress and the Administration to ensure that adequate funds are provided to congressionally approved projects. We fully support the efforts of this Committee to ensure that the Harbor Maintenance Trust Fund is used for its intended purpose—maintaining the country's commercial harbors.

Finally, we would like to offer our assistance and services to the Committee to hold on-site hearings at any of our seaports on the Gulf or Atlantic. We can provide the Committee and staff with port and navigational tours of Army Corps operations at our seaports, as well as committee hearing space for any necessary discussions with port administration, federal agency, and private sector maritime businesses.

Again, we applaud the bi-partisan efforts the House Transportation and Infrastructure Committee has undertaken on WRDA legislation. We are committed to providing any assistance the Committee might need on future legislative efforts.

Thank you for all of your efforts on behalf of this nation's seaports.

Sincerely,

DOUG WHEELER
President & CEO, Florida Ports Council

Letter of July 10, 2019, from Nicole Vasilaros, Senior Vice President of Government Relations and Legal Affairs, National Marine Manufacturers Association, Submitted for the Record by Hon. Grace F. Napolitano

WEDNESDAY, JULY 10, 2019.

Hon. PETER A. DEFAZIO
Chairman
House Committee on Transportation and Infrastructure

Hon. SAM GRAVES
Ranking Member
House Committee on Transportation and Infrastructure

Hon. GRACE F. NAPOLITANO
Chairwoman
Subcommittee on Water Resources and Environment

Hon. BRUCE WESTERMAN
Ranking Member
Subcommittee on Water Resources and Environment

DEAR CHAIRMAN DEFAZIO, RANKING MEMBER GRAVES, CHAIRWOMAN NAPOLITANO, AND RANKING MEMBER WESTERMAN:

On behalf of the National Marine Manufacturers Association (NMMA), I thank you for convening the "Water Resources Development Acts: Status of Implementation And Assessing Future Needs" hearing. As your subcommittee and the full committee the continues work to reauthorize the Water Resources Development Act (WRDA), NMMA encourages your consideration of the integral role this legislation plays in creating safe, reliable access for recreational boaters and in supporting the continued economic growth of the U.S. recreational marine industry.

By way of background, NMMA is the leading recreational marine trade association in North America, representing nearly 1,300 boat, marine engine, and accessory manufacturers. Recreational boating is a significant contributor to the U.S. economy, generating $170.3 billion in annual economic impact that supports more than 35,000 businesses and 691,000 jobs. Additionally, the outdoor recreation economy as a whole—which is driven by boating and fishing and includes RVing, guided tours, and motorcycling and ATVing—accounts for 2.2 percent of U.S. GDP, $734 billion in gross economic output, and 4.5 million jobs. In terms of GDP, outdoor recreation is larger than mining, utilities, and chemical products manufacturing.

Outdoor recreation is a substantial and rapidly increasing part of the U.S. economy. For our industry—and the entire U.S. economy—to continue to grow, it is essential that port maintenance and dredging projects are sufficiently funded. Additionally, adequate funding will help create jobs in coastal and inland waterway communities, improve access for water-based recreational activities, and make conditions safer for the recreational boating and angling communities.

First and foremost, full utilization of Harbor Maintenance Trust Fund (HMTF) revenue for harbor maintenance activities is essential. The HMTF was created to ensure that our nation's harbors would always be properly dredged and fully operational, yet much of the fund's annually collected revenue does not make its way back to where it was originally intended and is desperately needed. In fact, the U.S. Army Corps of Engineers (Corps) estimates that full channels at the nation's 59 busiest ports are available less than 35 percent of the time—and the conditions of small and emerging harbors are far worse. The result of insufficient funding for maintenance and dredging projects is the deterioration of our nation's ports, harbors, and waterways, which support thousands of jobs and commercial and recreational economic development nationwide.

There are sufficient funds in the HMTF to meet the maintenance dredging needs of all federally-authorized ports. Full utilization of the fund would provide the necessary funding to enable the Corps to dredge all federal harbors to their constructed widths and depths. Improperly dredged channels exacerbate user conflict in our busy ports and harbors, impacting safety and important access points for recreational boaters as well.

NMMA also encourages the committee to consider reforming the Corps' dredging project prioritization process to accurately account for the economic benefits of investing in projects that facilitate recreational use. Under the current process, the Corps give priority to coastal harbors and inland waterways with the most commercial traffic, while simultaneously providing priority for maintenance of channels at small ports that support significant commercial fishing, subsistence, or public transportation benefits. A recent study found that in 2017, Michigan's ports and harbors produced $19.7 billion in economic impact, and of that amount, water-based tourism

and recreation economic impacts were nearly four times the size of commercial economic impacts.[1]

This flawed system fails to properly account for the value created by access for recreational activities—effectively putting boaters and the recreational boating industry's $170.3 billion annual economic activity at a disadvantage. Small recreation-based shallow draft harbors are critical access points for marinas and coastal communities where businesses and local communities depend on marine recreation-based economic activity. Additionally, without sufficient dredging in these areas, some recreational boaters are forced to use high traffic commercial channels, which can lead to potential user conflicts and safety concerns.

The prioritization process should be amended to account for the economic impacts directly tied to investing in recreational-based projects by ensuring that a percentage of existing available funds are allocated for three different categories: High-Tonnage, Low-Tonnage, and Commercial or Recreational ports. In addition, increases in social, cultural, and environmental benefits should be considered in the allocation of the three funding categories where appropriate.

Furthermore, NMMA recommends that the committee direct the Corps to study alternative and recyclable solutions for disposal of dredged materials, thereby forgoing the continued traditional landfill disposal of dredged material and delivering multiple economic and environmental benefits to local economies. Due to the naturally occurring process of sedimentation, overtime, rivers, lakes, harbors, and bays can become filled with debris, sand, mud, silt, and other materials that reduce waterway depths, making them difficult to navigate and posing environmental and safety hazards. Proper dredging of these sediment materials plays a critical role in maintaining clean and healthy waterways for local ecosystems and providing access to the recreational boating and angling communities. The Corps estimates that hundreds of millions of cubic yards of dredged materials need to be excavated each year to keep the nation's waterways open for commercial and recreational use. Exploring options to increase the use of alternative and recyclable solutions will facilitate new opportunities to more efficiently and sustainably deliver economic, environmental, and societal benefits through the disposal of dredged materials.

The federal government is responsible for maintaining our nation's ports, harbors, and waterways. Applying the full balance of the HMTF to harbor maintenance projects will ensure the fees collected in the fund are not diverted from critical dredging projects but used to deliver an economic boost to the U.S. commercial and recreational boating industries that depend on well maintained waterways. NMMA appreciates your consideration and stands ready to assist you and the committee throughout this important endeavor.

Sincerely,

NICOLE VASILAROS
Senior Vice President of Government Relations and Legal Affairs,
National Marine Manufacturers Association

Article, "Breached Levee Sucks in Barges in Alexander County, Highlighting Need for Repairs, Officials Say," by Gabriel Neeley-Streit, The Southern, July 3, 2019, Submitted for the Record by Hon. Mike Bost

MILLER CITY—Overnight Wednesday, six connected barges came loose from their tugboat and were sucked through the breach in the Len Small levee in Alexander County.

The current pushed the barges out over flooded farmland near Miller City, said Alexander County Engineer Jeff Denny, where they came to rest apparently after colliding with an irrigation system.

Two similar accidents had been narrowly avoided in the past month, Denny said, because those tugboats had engines strong enough to escape the water flowing into the ¾-mile-wide hole in the levee.

This time, no such luck.

There were no injuries nor damage to barges, which were all empty, said Kent Furlong, owner of Hines Furlong Line, the barge company.

However, the barges appear to have taken out power lines in their path across the flooded fields, Denny said.

[1] Magnini, V., Boik, W., Crotts, J. (2018). *The Economic and Fiscal Impacts of Michigan's Ports and Harbors.* Institute for Service Research.

As Hines Furlong worked to remove the vessels on Wednesday, county leaders said the incident is a reminder of the need to fix the levee, which the U.S. Army Corps of Engineers has ignored for several years.

The Len Small Levee is located between Mississippi River mile marker 21 and mile marker 35 in far southern Alexander County, near an area of farmland known as Dogtooth Bend.

It has failed repeatedly over the last decade. In January 2011, flooding left "a 5,000-foot breach," according to Professor Kenneth Olson, of the University of Illinois.

The levee was repaired that year by the U.S. Army Corps of Engineers, working together with local farmers, only to breach again in a different location in 2016.

At that time, the U.S. Army Corps of Engineers declined to fix the hole, saying the economic losses on the flooded land were not great enough to justify the projected $16 million cost of fixing the levee.

Instead, the federal agency opted for a stopgap, Denny said, twice laying thousands of pounds of rock, known as rip-rap, to strengthen the bottom of the breached area and the levee walls, in order to prevent further erosion.

But with the prolonged flooding of 2019, residents of the area report the ¾-mile-hole in the levee continues to grow.

"I would love to know how many millions they've spent, and now we're pretty much back to square one," Denny said.

The true extent of this year's damage won't be clear until floodwaters recede from the estimated 25,000 acres of farmland flooded because of the failing levee, Denny said.

But regardless, local officials will continue to make the same request, Denny said: fill the hole.

"We are looking at the consequences of federal policy failing to reflect the critical role that levees play beyond flood prevention, such as maintaining safe commercial navigation. This makes no sense and it's costing Southern Illinois dearly," said U.S. Rep. Mike Bost on Wednesday.

To help the levee get patched, Bost introduced a provision in the Water Resources Development Act, approved by the U.S. House last September, that allows local sponsors to pay the difference when the costs of a levee repair are deemed to be financially greater than the flood protection benefits.

However, the provision's implementation on the Len Small has been stalled by differences in the legal interpretation of the law between the congressional lawyers who wrote it and the Corps of Engineers, Denny said.

"The Corps understands it to mean local entities can make up the difference only with cash contributions," Denny said, which would require Alexander County to put up over $3 million on the $16 million job. "But the intention of the law was to allow us to pay with work in kind."

In the past, when the Corps repaired the levee, the county was asked to cover 20% of project costs, Denny said, and did so via work in kind, with many farmers giving their time and equipment to help with construction.

In the 2011 repairs, local farmers did about 50% of the work, he estimated.

Alexander County residents hoped to bear a greater burden of labor, under Bost's proposal, to get the USACE to sign on to the new repairs.

But for now that possibility remains a "back and forth" discussion at the federal level, Denny said, and no USACE work is expected on the levee.

The Corps of Engineers did not respond Wednesday to questions about its position on the levee.

Meanwhile, the flood fight continues in the nearby villages of East Cape Girardeau and McClure.

On Wednesday, the Illinois Department of Transportation's announced the closure of Illinois 146, which runs west from East Cape to Cape Girardeau, over the Bill Emerson Memorial Bridge.

The road, which is covered by 6 or more inches of water in spots, had been closed to low vehicles, but open to trucks and SUV's, according to Jerry Held, Alexander County Emergency Management Agency assistant coordinator.

Now, only emergency vehicles and government vehicles will be allowed access, Held said.

Sandbagging continues in the communities of East Cape and McClure, and residents of East Cape are still advised to prepare for voluntary evacuation if necessary.

From Springfield, Gov. J.B. Pritzker sent a letter to U.S. Agriculture Secretary Sonny Perdue on Wednesday asking him to issue a disaster declaration for Illinois farmers. The declaration would make new federal resources available to those whose planting season was affected by flooding and heavy rainfall.

"For months, our state has been battling historic flooding, causing untold damage to homes, businesses, and farms across Illinois," Pritzker said. "For our farmers, this has meant delaying, reducing, or even eliminating planting, hurting a core state industry and impacting working families across Illinois. While the state will continue to do everything we can to help, a Secretarial Disaster Declaration will provide much needed aid to impacted farmers in Illinois and I am hopeful the USDA will make this declaration."

Jane Satterlee is boated out from her trailer on June 11 in East Cape Girardeau by National Guardsmen Andrew Lucas and Tony Clark.—Isaac Smith

Letter of February 14, 2019, from David P. Ross, Assistant Administrator, Office of Water, Environmental Protection Agency, Submitted for the Record by Hon. Brian J. Mast

FEBRUARY 14, 2019.

Hon. BRIAN J. MAST
House of Representatives, Washington, DC 20515

DEAR CONGRESSMAN MAST:

Thank you for your October 26, 2018, letter requesting the U.S. Environmental Protection Agency (EPA) to provide information on cyanobacteria and cyanotoxins, You specifically requested the EPA's expertise on two questions:

1. *Do you consider microcystins algae, blue-green algae, and cyanobacteria to be toxins?*
2. *At what level do you consider each to be harmful to human health?*

The EPA understands your concern about the presence of harmful algal blooms (HABs) in Lake Okeechobee and the potential adverse impacts these blooms could have on human and ecosystem health.

Cyanobacteria and their toxins are considered a serious and growing threat to human health. In freshwater, cyanobacteria, sometimes called "blue-green algae," are the major HABs-forming group. Cyanobacteria are microorganisms that can produce harmful cyanotoxins, such as microcystins, cylindrospermopsin, and anatoxin-a. Adverse health outcomes from exposure to cyanotoxins may range from a mild skin rash to serious illness. Specifically, some of the adverse effects reported after exposure to these toxins in drinking water include damage in the liver, kidney, and nervous system. Symptoms reported after acute recreational exposure to cyanobacterial blooms includes skin irritations, allergic reactions, and gastrointestinal illnesses.

Regarding the levels at which these toxins can be harmful to human health, in 2015, the EPA developed non-regulatory drinking water health advisories (HAs) for two cyanotoxins, microcystins and cylindrospermopsin, to assist federal, state, and

local officials, and managers of public or community water systems to protect public health from cyanotoxins in drinking water. The EPA developed HAs for bottle-fed infants and pre-school children (0.3 μg/L for microcystins and 0.7 μg/L for cylindrospermopsin) and for school-age children and adults (1.6 μg/L for microcystins and 3.0 μg/L for cylindrospermopsin). The EPA also developed health effects support documents for the cyanobacterial toxins anatoxin-a, cylindrospermopsin, and microcystins summarizing relevant information on occurrence in surface water systems and toxicology and epidemiology data. The HAs and health effects support documents for cyanotoxins can be found on the EPA Drinking Water Health Advisory website: www.epa.gov/ground-water-and-drinking-water/drinking-water-health-advisory-documents-cyanobacterial-toxins.

In 2016, the EPA published draft Recreational Criteria/Swimming Advisories for Microcystins and Cylindrospermopsin under Section 304(a) of the Clean Water Act (CWA) for public comment. These Criteria/Advisories focus on health risks associated with recreational exposure to fresh waters contaminated with microcystins and/or cylindrospermopsin. The EPA is currently revising the draft criteria document based on the public comments and we plan to issue final criteria recommendations in 2019.

The EPA continues to evaluate the human health effects from cyanobacteria and the toxins they produce in drinking and recreational waters. In 2015, as part of the Drinking Water Protection Act, the EPA developed a drinking water strategic plan for assessing and managing the risks of algal toxins impacting public drinking water systems. The strategic plan includes assessing the human health risks from emerging toxins, including microcystins. The EPA also listed cyanotoxins on the drinking water Contaminant Candidate List for further assessment of health effects data. In addition, the EPA, states, and drinking water utilities are implementing plans to monitor the nation's drinking water systems to determine the extent of contamination by cyanotoxins through the Unregulated Contaminant Monitoring Rule.

The EPA will continue to invest resources in researching human health effects and developing risk communication materials to protect human health from cyanobacterial toxins in drinking and recreational waters. The EPA developed several support recommendations and communication tools for public water systems, including: *Recommendations for Public Water Systems to Manage Cyanotoxins in Drinking Water*, *Cyanotoxin Management Plan Template and Example Plans*, *Drinking Water Cyanotoxin Risk Communication Toolbox*, and *Water Treatment Optimization for Cyanotoxins Document*. The EPA also published communication materials for states, tribes, and communities to use to protect public health during cyanobacterial HABs in recreational waters, including: *Recommendations for Cyanobacteria and Cyanotoxin Monitoring in Recreational Waters*, and *Recreational Water Communication Toolbox for Cyanobacterial Blooms*. These and more resources on cyanotoxins are available on the EPA Cyanobacterial HABs website: epa.gov/nutrient-policy-data/cyanobacterial-harmful-algal-blooms-water.

Again, the EPA appreciates your concern regarding cyanobacterial toxins in freshwater systems in Florida and is committed to working with the appropriate agencies to protect human health. The EPA coordinates with federal agencies and states and provides technical assistance during HABs and emergencies, such as the recent cyanotoxin events in Florida. During the HABs events in Lake Okeechobee, the EPA Office of Water and the EPA Region 4 Water Quality Planning Branch provided technical assistance to the Florida Department of Environmental Protection to address public health concerns. The EPA also supports and assists three National Estuary Programs in southwest Florida: the Tampa Bay Estuary Program, the Sarasota Bay National Estuary Program, and the Charlotte Harbor National Estuary Program, If you have further questions, please contact me, or your staff may contact Denis Borum in the EPA's Office of Congressional and Intergovernmental Relations.

Sincerely,

DAVID P. ROSS
Assistant Administrator

Press Release of May 22, 2019, Issued by the Environmental Protection Agency, Submitted for the Record by Hon. Brian J. Mast

NEWS RELEASES FROM HEADQUARTERS > WATER (OW)

EPA ISSUES RECOMMENDATIONS FOR RECREATIONAL WATER QUALITY CRITERIA AND SWIMMING ADVISORIES FOR CYANOTOXINS

MAY 22, 2019.

WASHINGTON—Today, as part of the U.S. Environmental Protection Agency (EPA)'s efforts to better protect Americans' health when they swim or play near the water this summer, EPA is issuing new recommendations for water quality criteria and swimming advisory values for two cyanotoxins.

"With Memorial Day and summer vacations around the corner, EPA is providing this information to help Americans know when it is safe to swim and play near the water," said EPA Office of Water Assistant Administrator David Ross. "EPA's new recommendations will help state and local officials make informed decisions about when to issue local water quality and swimming advisories that are designed to protect the public, especially vulnerable populations like our nation's children."

Algal blooms caused by cyanobacteria sometimes produce cyanotoxins at concentrations that can be harmful to people swimming or participating in other activities in or on the water. States can adopt EPA's recommended cyanotoxin values into their water quality standards or use the values as the basis for issuing a local swimming advisory.

Based on the latest scientific information, EPA has established recommended water concentrations, at or below which protects public health, for the cyanotoxins microcystins (8 micrograms per liter) and cylindrospermopsin (15 micrograms per liter). EPA's recommendations are protective of all age groups and are based on peer-reviewed and published science.

EPA is also releasing infographics that states and communities can use to communicate basic information about harmful algal blooms (HABs) to the public. The infographics highlight how HABs may affect both people and animals and provide guidance on how to identify and respond to a potential HAB. States, tribes and waterbody managers can download handout- and poster-sized infographic files, along with instructions on how to add local contact information, from EPA's newly refreshed Cyanobacterial HABs website.

EPA will soon release draft technical support materials for public comment that, when final, are intended to help interested states and authorized tribes in implementing these recommended values. Support materials will include information on waterbody monitoring, assessing attainment of water quality standards, listing of impaired water bodies and developing total maximum daily loads under Clean Water Act section 303(d).

For more information about the recommended criteria and swimming advisories visit: https://www.epa.gov/wqc/recreational-water-quality-criteria-and-methods

To download EPA's HABs infographics, visit https://www.epa.gov/cyanohabs/infographics-help-educate-public-habs-basics.

LAST UPDATED ON MAY 22, 2019

Letter of May 1, 2019, from Robert Redfield, M.D., Director, Centers for Disease Control and Prevention, and Administrator, Agency for Toxic Substances and Disease Registry, Submitted for the Record by Hon. Brian J. Mast

MAY 1, 2019.

Hon. BRIAN MAST
U.S. House of Representatives, Washington, DC 20515

DEAR REPRESENTATIVE MAST:

Thank you for your letter requesting information regarding toxins and toxic water. You expressed particular interest in cyanobacteria (also known as blue-green algae) and microcystins.

Enclosed with this response are answers to your questions.

Thank you, again, for your letter. We hope this information is helpful. If you have any additional questions or concerns. please contact Eric Wortman or Amanda Crouse in the Centers for Disease Control and Prevention's (CDC) Washington Office.

Sincerely,

ROBERT REDFIELD, M.D.
Director, CDC, and
Administrator, Agency for Toxic Substances and Disease Registry

Enclosure

THE CENTERS FOR DISEASE CONTROL AND PREVENTION'S ANSWERS TO QUESTIONS ABOUT CYANOBACTERIA AND MICROCYSTINS

1. Do you consider microcystin algae, blue-green algae, and cyanobacteria to be toxins?

The term algae refers to plant-like organisms that are multi-celled or single-celled and photosynthetic (i.e., use sunlight to create food). Algae are vitally important to oceans, lakes, and rivers because they are the building blocks of the food chain and ecosystem. Algae are also vital to bodies of water because they produce oxygen to sustain life. Multi-celled algae can include seaweed, and single-celled algae include microscopic organisms called phytoplankton.

Phytoplankton can be divided into two categories, cyanobacteria and microalgae. Cyanobacteria and microalgae are organisms, not toxins. Cyanobacteria may also be known as blue-green algae, although the more accurate term is cyanobacteria.

Cyanobacteria are not infectious and are not toxic per se. However, under the right environmental circumstances, cyanobacteria can exhibit exuberant growth, or bloom, and may produce toxins that can be released into the water. Toxins produced by cyanobacteria include anatoxin-a, beta-methylamino-L-alanine, cylindrospermopsin, nodularins, saxitoxins, and microcystins.

Microcystins are potent liver toxins produced by some species of cyanobacteria, including *Microcystis aeruginosa*. Microcystins can affect human, animal, and ecosystem health.

2. At what level or numeric threshold do you consider each to be harmful to human health?

Toxins produced by cyanobacteria (i.e., cyanobacterial toxins) vary in their chemical compositions and toxicities. The World Health Organization (WHO) and the U.S. Environmental Protection Agency (EPA) provide guidance on how to assess whether or not a cyanobacterial bloom is a potential threat to human health. This guidance is limited to microcystins and cylindrospermopsin, as limited data are available to develop guidance for many of the other cyanobacterial toxins. The Centers for Disease Control and Prevention refers to this guidance in its work with states and other public health partners to reduce the occurrence of harmful exposures to cyanobacterial toxins.

WHO guidance values for the relative probubility of acute health effects during recreational exposure to cyanobacteria and the probability of microcystins concentrations are based on cell counts and the concentrations of microcystin-LR (the most studied of the microcystins) and chlorophyll in the water.

You can find WHO's guidance values on EPA's website at www.epa.gov/nutrient-policy-data/guidelines-and-recommendations, and we have reproduced them in Table 1.

Table 1. WHO Guidance on Relative Probability of Acute Health Effects during Exposure to Varying Cells Counts of Cyanobacteria and Concentrations of Microcystin-LR and Chlorophyll

Relative Probability of Acute Health Effects	Cyanobacteria (cells/mL)	Microcystin-LR (μg/L)	Chlorophyll-a (μg/L)
Low	< 20,000	< 10	< 10
Moderate	20,000–100,000	10–20	10–50
High	100,000–10,000,000	20–2,000	50–5,000
Very High	> 10,000,000	> 2,000	> 5,000

EPA has created guidance in the form of health advisories, or HAs, that provide microcystin and cylindrospermopsin levels in drinking water sources and recreational waters to help determine the potential health risks from using the water.

The HAs are not regulations and should not be construed as legally enforceable federal standards. HAs may change as new information becomes available.

You can find the guidance for recreational waters at www.epa.gov/sites/production/files/2016-12/documents/draft-hh-rec-ambient-water-swimming-factsheet.pdf. We have reproduced the information in Table 2.

Table 2. EPA's Health Advisories for Microcystins and Cylindrospermopsin in Recreational Waters

Toxin	Swimming Advisory: not to be exceeded on any day Recreational Criteria for Waterbody Impairment: not exceeded more than 10 percent of days per recreational season up to 1 calendar year
Microcystins	4 μg/L
Cylindrospermopsin	8 μg/L

You can find EPA's guidance for drinking water at www.epa.gov/nutrient-policy-data/guidelines-and-recommendations#what3. We have reproduced the information in Table 3.

Table 3. EPA's Health Advisories for Microcystins and Cylindrospermopsin in Drinking Water

Toxin	Drinking Water Health Advisory (10-day) [1]	
	Bottle-fed infants and pre-school children	School-age children and adults
Microcystins	0.3 μg/L	1.6 μg/L
Cylindrospermopsin	0.7 μg/L	3 μg/L

Many states have also developed drinking water and recreational water guidance levels for various cyanobacterial toxins. You can find them on EPA's website at www.epa.gov/nutrient-policy-data/guidelines-and-recommendations.

Letter of April 16, 2019, from David D. Whiting, Deputy Director, Division of Environmental Assessment and Restoration, Florida Department of Environmental Protection, Submitted for the Record by Hon. Brian J. Mast

APRIL 16, 2019.

Hon. BRIAN MAST
United States House of Representatives, 2182 Rayburn House Office Building, Washington, DC 20515

DEAR CONGRESSMAN MAST:

Thank you for your letter dated March 18, 2019 asking about thresholds used to determine whether a cyanobacteria bloom is toxic.

First and foremost, the health of Florida residents and visitors is the primary concern to DEP and the Florida Department of Health (DOH). In my response to your earlier inquiry, I indicated the State of Florida relies upon a precautionary presence/absence approach that is much more stringent than numeric thresholds. This approach bases public health protections on the visible presence of cyanobacteria in a waterbody as the trigger mechanism for advisories, media releases, and other forms of public outreach. This approach is more protective and easier for the public to understand than using numeric thresholds to determine when to notify the public for a variety of reasons I will address below.

[1] Health advisories describe non-regulatory concentrations of drinking water contaminants at or below which adverse health effects are not anticipated to occur over specific exposure durations (e.g. one day, 10 days, several years, and a lifetime). The health advisory fact sheet for microcystins and cylindrospermopsin can be found at www.epa.gov/sites/production/files/2017-06/documents/cyanotoxins-fact__sheet-2015.pdf.

The World Health Organization's (WHO) thresholds (https://www.who.int/water_sanitation_health/resourcesquality/toxcyanchap5.pdf) for recreational bathers, including swimmers, sail-board riders and water skiers, are 10 micrograms per liter of microcystin-LR (MC-LR) for a low probability of adverse effects (e.g., irritative or allergic reactions that affect less than 30% of the population and "result in discomfort rather than serious health outcomes") and 20 micrograms per liter of MC-LR threshold for moderate probability of health effects (e.g., increased long-term risk through ingestion). The WHO suggests health organizations should use these thresholds to determine when to notify the public and what risk to convey. Florida's approach of "See it, stay away" is more proactive and thus more protective than relying solely on thresholds to determine course of action.

The United States Environmental Protection Agency (EPA) has produced draft thresholds for recreational waters for microcystins (8 micrograms per liter) and cylindrospermopsins (15 micrograms per liter), however these thresholds have not been finalized.

There are a number of reasons why the State of Florida believes a more precautionary approach, one based simply on the presence of a cyanobacteria bloom, is warranted over specific toxin thresholds, these include:

1.) rapidly changing bloom conditions;
   a. wind, current, tide, atmospheric pressure, and time of day can significantly influence where and how densely a bloom is concentrated;
2.) the time required to sample, ship, analyze, and then report toxin concentrations take too long to effectively support management decisions regarding the need for placing or removing an advisory;
   a. under our current expedited sampling and analysis routine, the time required from sample collection to results reporting is 3–4 days;
3.) cyanobacteria have the potential to produce many other cyanotoxin compounds besides MC–LR for which no human health thresholds currently exist;
   a. other cyanotoxins include other microcystins (there are more than 240 known, but analytical standards exist for only about a dozen), aeruginosins, cyanopeptolins, anabaenopeptins, microviridins, cyclamides, lipopolysaccharides, polyketides, and some non-essential amino acids;
   b. EPA has not offered sufficiently robust guidance on what sample collection or analytical chemistry methods should be used when quantifying cyanotoxins;
   c. This could lead to large variations in reported values and the potential to underestimate the public health risk posed by a bloom;
4.) poor scientific understanding of what triggers blooms to start or stop producing toxins;
   a. levels of toxin production may be influenced by nutrient concentrations, which strains of cyanobacteria species are dominant, and the health of bloom; however little information exist that can currently be used to predict whether a bloom will be toxic or not.

I hope you find this information useful. Should you need more information, please don't hesitate to contact me again.

Sincerely,

DAVID D. WHITING
Deputy Director, Division of Environmental Assessment and Restoration

Letter of November 9, 2018, from David D. Whiting, Deputy Director, Division of Environmental Assessment and Restoration, Florida Department of Environmental Protection, Submitted for the Record by Hon. Brian J. Mast

NOVEMBER 9, 2018.

Hon. BRIAN MAST
United States House of Representatives, 2182 Rayburn House Office Building, Washington, DC 20515

DEAR REPRESENTATIVE MAST:

Thank you for your inquiry and your interest in cyanobacteria and the management of Lake Okeechobee. As Deputy Director of the Florida Department of Environmental Protection's (DEP) Division of Environmental Assessment and Restoration, I oversee the sampling and processing of cyanobacteria in Florida's freshwater environments, and Secretary Valenstein has asked me to respond to your letter on his behalf. This is a relatively complex issue, and while I am happy to address your

questions below, I also remain available to offer any technical assistance you may need.

Cyanobacteria, also known as blue-green algae, are a group of bacteria that can be found all over the world and naturally occur in Florida's freshwater and marine habitats. These bacteria are microorganisms that function like algae in that they are capable of photosynthesis and derive their energy from the sun.

Cyanobacterial cells may or may not contain toxins. Even when a cyanobacterial cell has the necessary genes to enable it to produce toxins, it may not always do so. Scientists are still actively researching what environmental conditions trigger a cyanobacteria cell to produce toxins.

Microcystins are one class of toxins that can be produced by some species of cyanobacteria. In Florida, the most common microcystin experienced is *Microcystis aeruginosa*. The microcystin toxins are usually contained within the cell until cell death, when the cell wall fails and the toxins are released into the surrounding water.

Because cyanobacterial cells are capable of, but do not always produce or release toxins, the Department focuses its sampling efforts on the locations that best represent the overall condition and water quality of the bloom affected water. DEP and other state and local agencies collect samples when algal blooms are observed during their routine water quality monitoring, as well as in response to public reports. To make it easy for the public to report algal blooms, the Department has established both a hotline and online tool at www.reportalgalbloom.com or toll-free at 1-855-305-3903. Our laboratory performs both cyanotoxin and algal taxonomy analyses on samples collected, with results typically provided to the public within 3–4 days of collection on DEP's webpage.

The Florida Department of Health (DOH) is the lead state agency for addressing potential human health impacts related to cyanobacteria and other harmful algal blooms (HAB). DOH monitors the State's Poison Control hotline 1-800-222-1222 and emergency room reports for possible HAB-related activity. DOH also provides technical assistance and educational materials to local health departments in affected counties.

Due to the highly variable nature of cyanobacteria blooms in Florida's waters, DOH and DEP agree that numeric toxin thresholds are not the most protective mechanism to trigger a recreational advisory or closure threshold. Algal blooms conditions can change too rapidly for analytical results to accurately reflect current conditions. Florida uses a more precautionary approach and advises citizens and visitors to avoid recreating in any surface waters with visible algae present. DOH implements this precautionary presence/absence strategy for protecting the public when recreating in surface waters, warning the public to avoid contact and use of waters experiencing a cyanobacteria bloom.

The United States Environmental Protection Agency (EPA) has published drinking water thresholds for two cyanotoxins, microcystins and cylindrospermopsin (https://www.epa.gov/ground-water-and-drinking-water/additional-information-about-cyanotoxins-drinking-water). Public drinking water facilities in Florida are currently monitoring for these toxins in response to EPA's Unregulated Contaminant Monitoring Rule (https://www.epa.gov/dwucmr/fourth-unregulated-contaminant-monitoring-rule).

I hope this information provides more clarification. Should you need more information in the future, the Department proudly boasts a team of a capable and knowledgeable scientists who stand ready to serve as a technical resource for you.

Sincerely,

DAVID D. WHITING

Deputy Director, Division of Environmental Assessment and Restoration

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Validation Study—Wrightsville Beach, North Carolina, June 2019, Submitted for the Record by Hon. David Rouzer

The United States Army Corps of Engineers (USACE) has prepared a Validation Study for the Wrightsville Beach, N.C. Coastal Storm Risk Management (CSRM) project. The Study's purpose is to determine continued Federal interest (through 2036) and to increase the total construction cost capacity established by Section 902 of the Water Resources Development Act (WRDA) of 1986. We anticipate a WRDA 2020 authorization will allow the opportunity for ongoing Federal participation.

This Validation Study is being conducted under the existing project authority and is a cost-shared effort with the non-Federal sponsor, the Town of Wrightsville Beach. The USACE is the lead agency with the Bureau of Ocean Energy Manage-

ment (BOEM) as a cooperating agency. Project Delivery Team (PDT) representatives include members of the USACE Wilmington, Jacksonville and Savannah Districts with participation by the Town of Wrightsville Beach, New Hanover County and other Federal and State agencies.

The report is a fully Integrated Validation Study and Environmental Assessment that complies with the National Environmental Policy Act (NEPA) and the USACE's water resources planning process. The Recommended Plan would not result in any significant impacts to federally-listed threatened or endangered species or their designated critical habitat, would have no significant impact to sites listed or eligible for inclusion on the National Register of Historic Places, would not significantly impact any wetlands or waters of the U.S., nor any protected wildlife habitat. Informal Section 7 coordination with the US Fish and Wildlife Service (USFWS) has been successfully completed. The USFWS and the National Marine Fisheries Service (NMFS) have been actively involved throughout this study and will have additional opportunity to provide input, as will the public, during a 30-day public review period ending early August 2019.

The Recommended Plan is the environmentally preferred alternative as assessed by PDT participants. Coordination with resource agency representatives was initiated early in the study. Appropriate avoidance and minimization measures (i.e. environmental windows, beach placement activities, borrow source selection and use, etc.) were developed and integrated into the Validation Study process. These measures reduce project impacts and conserve Federal and non-Federal funds.

The Wrightsville Beach Recommended Plan expects annual benefits of $10,425,000 and average annual costs of $2,004,000; yielding a benefit to cost ratio of 5.2 to 1.

Beach Renourishment Evaluation Report—Carolina Beach, North Carolina, June 2019, Submitted for the Record by Hon. David Rouzer

The United States Army Corps of Engineers (USACE) has prepared a Beach Renourishment Evaluation Report (BRER) for the purpose of determining continued Federal interest and extending the Carolina Beach, N.C. Coastal Storm Risk Management (CSRM) project an additional 15 years (through 2036). The study was conducted under Section 1037 of the Water Resources Reform and Development Act of 2014. With continued Federal interest determined, a Water Resources Development Act (WRDA) of 2020 authorization will allow for ongoing Federal participation.

Project Delivery Team (PDT) representatives included members of the USACE Wilmington, Jacksonville and Savannah Districts with the participation by the Town of Carolina Beach, New Hanover County and other Federal and State agencies. The Town of Carolina Beach, as the non-Federal sponsor, has cost-shared the BRER.

The BRER is a fully integrated evaluation report and Environmental Assessment that complies with the National Environmental Policy Act (NEPA) and the USACE's water resources planning process. The Recommended Plan would not result in any significant impacts to federally-listed threatened or endangered species or their designated critical habitat, would have no significant impact to sites listed or eligible for inclusion on the National Register of Historic Places, would not significantly affect any wetlands or waters of the U.S., nor any protected wildlife habitat. Informal Section 7 coordination was successfully completed with the US Fish and Wildlife Service (USFWS). The USFWS and the National Marine Fisheries Service (NMFS) have been actively involved throughout this evaluation and will have an additional opportunity to review and comment on the report, as will the Public, during the 30-day state and agency review period ending in early August 2019.

The Recommended Plan is the environmentally preferable alternative as assessed by PDT participants. Coordination with resource agency representatives was initiated early in the study and appropriate avoidance and minimization measures (i.e. environmental windows, beach placement activities, borrow source selection and use, etc.) were developed and integrated during the BRER process reducing project impacts and conserving Federal and non-Federal funds.

The Carolina Beach Recommended Plan expects annual benefits of $6,749,000 and average annual costs of $1,718,000; yielding a benefit to cost ratio is 3.9 to 1.

APPENDIX

QUESTIONS FROM HON. EDDIE BERNICE JOHNSON TO HON. R.D. JAMES, ASSISTANT SECRETARY OF THE ARMY FOR CIVIL WORKS, OFFICE OF THE ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS)

Question 1. One of the Corps main mission areas involves flood and storm damage reduction. The north central region of Texas suffers from significant flooding.

How can the Corps develop national programs that focus on preventing flooding rather than being reactive and responding to flooding?

ANSWER. Flood and storm damage reduction is a primary mission for the Corps. The Corps currently has several national programs under which they provide flood risk hazard data and technical assistance to states and local communities to support their efforts to understand, reduce and prevent flooding. These programs include the Flood Plain Management Services, Planning Assistance to States, and Silver Jackets. The Corps also has the authority to study and construct flood and storm damage reduction projects of limited size and scope through Section 205 of the Continuing Authorities Program. Finally, the Corps conducts specifically authorized flood risk management feasibility studies through the Investigations program which can lead to the construction of specifically authorized projects that focus on preventing future flooding.

Question 2. How can the Corps share information of flooded areas with navigation technology providers to re-route drivers away from flooded roads and highways?

ANSWER. Local government agencies are responsible for managing and directing local evacuation plans during flood events. Any information on flooded roads would need to come from the local governments.

Question 3. Does the Corps have the authority it needs to address stormwater runoff, filtering stormwater, and recharge aquifers?

ANSWER. Stormwater runoff, filtering stormwater, and aquifer recharge are typically a local responsibility. However, Section 219 of WRDA 1992, as amended, provides authority to the Corps to carry out water-related environmental infrastructure and resource protection and development projects.

QUESTIONS FROM HON. JARED HUFFMAN TO HON. R.D. JAMES, ASSISTANT SECRETARY OF THE ARMY FOR CIVIL WORKS, OFFICE OF THE ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS)

Question 1. I recently offered an amendment to the Energy and Water appropriations bill that would limit funding to complete the EIS for Pebble Mine. Based on what I have heard from commercial fishermen, recreational fishermen, Native Alaskans, and many others, I believe the risks of this mine in Bristol Bay are too high.

Just after the House adopted my amendment on a bipartisan basis the Environmental Protection Agency (EPA) submitted their comments on the Draft EIS to your agency. In over 200 pages of detailed comments, the EPA essentially said the EIS does not accurately estimate the negative impacts of the mine and that the agency does not think the project will comply with the Clean Water Act.

I respectfully request that you provide the Committee with a written response to each issue raised by the EPA in detail within sixty days. Specifically, how do you address EPA's concern that the mine could result in the loss of genetic diversity within the Bristol Bay salmon populations. In addition, please address the shortfalls in the overall analysis and the compensatory mitigation plans.

Additionally, as you know, the guidelines for a 404 Clean Water Act Permit require the Corps to analyze alternatives to a proposed discharge of dredged or fill material and "select the least environmentally damaging practicable alternative." As part of this process, the Corps must provide that "a[n] alternative is practicable if

it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes."

As part of determining the overall project purpose, the Corps must consider the objectives of an applicable governmental land use plan, which in the case of the Pebble Mine in Alaska would include the 2005 Bristol Bay Area Plan for State Lands as later amended in 2013 (2013 BBAP). Please provide to the Committee evidence that the Corps has considered the objectives of the 2013 BBAP.

ANSWER. A complete response to all of EPA's comments cannot be provided at this time and will likely not be complete until the publication of the final EIS, as resolution of some of the issues may require further investigations/studies and/or analysis and discussion with EPA. The Corps is currently reviewing EPA's comments and has conducted technical workshops with cooperating agencies, including EPA. Review of the comments, combined with information obtained during the workshops, will allow the Corps to determine where data gaps and shortfalls in the overall analysis may exist in the draft EIS. This is an important step in the NEPA process and will identify sections of the draft EIS that need additional work. The Corps intends to address all substantive comments, including EPA's, in the final EIS, which is currently not scheduled to be completed until mid-2020.

Development of the final compensatory mitigation plan is an iterative process. The conceptual compensatory mitigation plan was included in the draft EIS to solicit input from stakeholders for potential compensatory mitigation options. The Corps will consider this input and work with the applicant to develop a final compensatory mitigation plan. A compensatory mitigation plan would not be finalized until after the applicant has demonstrated all practicable avoidance and minimization measures for the applicant's preferred alternative.

The overall project purpose is used in the development and evaluation of the least environmentally damaging practicable alternative under the Corp's Clean Water Act 404(b)(1) evaluation. It is the Corps' responsibility to define the overall project purpose, however the applicant's needs and the type of project are considered when defining the overall project purpose. The Corps will consider land use as part of the public interest review that is required for this permit application. The Corps' regulations state that the primary responsibility for determining zoning and land use matters rests with state, local, and tribal governments, and the Corps will normally accept decisions by such governments on those matters unless there are significant issues of overriding national importance (33 CFR 320.4(j)(2)).

The Bristol Bay Area Plan (BBAP) was developed and is implemented by the State, and the Corps will give full consideration and appropriate weight to any comments the State may have regarding the consistency of the proposed project with the BBAP.

Question 2. Secretary James, there are multiple efforts within California to restore rivers and streams in order to recover salmon runs and other fish and wildlife habitat. Some components of these efforts are eligible for CAP funding, yet project managers don't apply based on the view that the program is oversubscribed and underfunded. Can you please provide the Committee with an region by region analysis of the demand for CAP funding compared to the actual funding provided to the program by Congress?

ANSWER. It is difficult to estimate with any accuracy the demand for CAP funding. For example, some proposals may not be viable. Also, some non-Federal sponsors may be constrained in their ability to move forward on potential projects. The table below shows the funds available for obligation as of June 30, 2019 and represents both regular and supplemental appropriations.

CAP FY 2019—Federal Funds Available for Obligation and Total Demand by Region

	LRD Funds Avail for Oblig	MVD Funds Avail for Oblig	NAD Funds Avail for Oblig	NWD Funds Avail for Oblig	POD Funds Avail for Oblig	SAD Funds Avail for Oblig	SPD Funds Avail for Oblig	SWD Funds Avail for Oblig	Total Funds Avail for Oblig
Section 14 ..	$5,472,647	$2,477,612	$2,535,193	$1,573,617	$25,893	$1,924,819	$238,986	$837,041	$15,085,807
Section 103	$845,975	$60,908	$1,517,88	$2,952,647	$170,368	$57,700	$430,346	$12,006	$6,047,338
Section 107	$4,154,060	$138,913	$3,636,658	$(205,428)	$316,728	$77,409	$5,193,222	$42,002	$13,353,566
Section 111	$78,774	$10,017	$385,303	$20,053	$22	$159,310	$20,840	$78	$674,398
Section 204	$546,466	$800,178	$1,570,945	$112,277	$10,267	$116,964	$57,381	$11,323	$3,225,802
Section 205	$6,515,870	$405,271	$1,717,288	$2,756,815	$1,060,496	$921,108	$1,772,728	$1,326,593	$16,476,169

CAP FY 2019—Federal Funds Available for Obligation and Total Demand by Region—Continued

	LRD Funds Avail for Oblig	MVD Funds Avail for Oblig	NAD Funds Avail for Oblig	NWD Funds Avail for Oblig	POD Funds Avail for Oblig	SAD Funds Avail for Oblig	SPD Funds Avail for Oblig	SWD Funds Avail for Oblig	Total Funds Avail for Oblig
Section 206	$2,435,239	$309,517	$4,140,138	$960,359	$82,694	$4,406,713	$374,736	$976,434	$13,685,829
Section 1135	$449,026	$235,452	$2,697,674	$4,213,172	$20,169	$636,623	$1,201,304	$88,877	$9,542,299
Totals	$20,498,058	$4,437,869	$18,200,586	$12,383,512	$1,686,638	$8,300,647	$9,289,543	$3,294,355	$78,091,208

[1] Data as of 30 Jun 2019.
[2] Includes unobligated supplemental funds from PL 113–2 and PL 115–123.

QUESTIONS FROM HON. JOHN GARAMENDI TO HON. R.D. JAMES, ASSISTANT SECRETARY OF THE ARMY FOR CIVIL WORKS, OFFICE OF THE ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS)

Question 1. Can you please provide a status update on the Sacramento District's Lower Cache Creek Feasibility Study and assure me that the Corps is doing everything possible to complete this critical Study as expeditiously as possible?

ANSWER. The project successfully completed the Tentatively Selected Plan (TSP) Milestone in February 2019 and the district is preparing to publicly release the draft Feasibility Report in December 2019. The Corps is processing a SMART Planning exemption for additional time and additional funding to complete the Chief's Report.

Question 2. When does the Corps expect to finalize the Programmatic Agreement among the Sacramento, San Francisco, and Los Angeles Districts and the California State Historic Preservation Officer regarding implementation of section 106 of the National Historic Preservation Act of 1966?

ANSWER. The Corps will provide the California State Historic Preservation Officer (CA SHPO) our final draft Programmatic Agreement on August 1, 2019. We will follow up with the SHPO on a regular basis to address any issues remaining until the SHPO has made a decision on the Programmatic Agreement.

Question 3. The Middle Creek Flood Damage Reduction and Ecosystem Restoration Project in Lake County, California, was authorized in Water Resources Development Act of 2007 (Public Law 110–114). Now 12 years later, it is far from completed despite $15 million in state funding secured recently. Is the Corps prepared to re-engage on the Middle Creek Flood Damage Reduction and Ecosystem Restoration Project, and can you please provide a timeline for the Project's estimated completion?

ANSWER. In January 2019, the local Non Federal Sponsor, Lake County, informed the Corps Sacramento District they had received a State grant to purchase real estate and were now ready to move forward with the project. In May 2019 the Corps met with Lake County and the State of California, Department of Water Resources to establish the path forward to restart the project. Lake County is currently conducting real estate acquisition with available local funding.

Funding to update and finalize the feasibility study for this project to include a revised Supplemental EIS/ROD to include Section 106 Cultural Resources and Section 7 Endangered Species Act compliance will be considered for future funding along with other programs, projects, and activities across the Nation competing for the available Federal resources. Upon receipt of funding, the Corps projects the study will take 16 to 20 months to complete.

Question 4. Will the Corps consider including the Middle Creek Flood Damage Reduction and Ecosystem Restoration Project in the Civil Works Work Plan for fiscal year 2020?

ANSWER. If Congress provides additional funding via an enacted appropriations bill in FY 2020, this project will be considered along with other projects, programs, and activities across the Nation competing for the available Federal resources.

Question 5. Given the small-scale of the Middle Creek Flood Damage Reduction and Ecosystem Restoration Project relative to other projects, will the Corps consider requesting a single appropriation for both the design and construction phases?

ANSWER. Prior to contemplating design and construction funding for this project, the Corps must first complete the feasibility study.

QUESTIONS FROM HON. GREG STANTON TO HON. R.D. JAMES, ASSISTANT SECRETARY OF THE ARMY FOR CIVIL WORKS, OFFICE OF THE ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS)

Environmental Infrastructure

Question 1. Some environmental infrastructure authorities have created regional programs for a state or multiple states. These programs can provide Corps assistance for multiple projects within the region. I have introduced legislation (H.R. 2206) to create a program for Arizona. Could you describe some benefits of a regional program to address water and wastewater infrastructure, such as flexibility to provide assistance to the most beneficial projects and meeting needs as they arise before performance and reliability are compromised, compared to environmental assistance authorities for a specific locality, such as the assistance under the 219 authority?

ANSWER. The primary value of regional environmental infrastructure programs is that the authorities may be more generic than the Section 219 authority and therefore a regional authority may be used to complete work that may not have been specifically contemplated at the time of authorization.

Rio Salado Oeste

Question 2. Rio Salado Oeste in the Salt River through the heart of Phoenix is a key Corps project that connects the completed Rio Salado Habitat Restoration Area to the east with the Tres Rios Environmental Restoration project to the west. To date, this project only has partial design completed. A Limited Re-evaluation Report (LRR) is needed to re-authorize this project and move this important connecting project forward. Can you please provide me with a plan on how best we move forward with a revised LRR for this project, the resources needed, and how those resources will be allocated within the Corps to create this report and any other steps necessary to obtain project authorization.

ANSWER. The Rio Salado Oeste Ecosystem Restoration project is not consistent with the policy and programs of the Executive Branch because the proposed plan does not represent an efficient way to target Federal and non-Federal resources for aquatic ecosystem restoration. The project, as currently authorized, includes upland areas that extend too far away (north and south) from the riparian zone which was historically supported by the natural hydraulics and hydrology of the respective watersheds. By including upland areas that are outside of the Corps' typical mission focus on wetland, riparian, and aquatic ecosystem restoration, the cost of the project is inflated and the aquatic ecosystem restoration benefits that would accrue to the nation are overstated and not cost effective. To put this proposed project on par with similar desert southwest aquatic ecosystem restoration activities, upland habitat restoration would need to be removed from the project or provided by others as part of a locally preferred plan. The City of Phoenix, the non-Federal sponsor, has provided a Letter of Intent to re-initiation the study to evaluate options to reformulate the project to address the afore-mentioned outstanding concerns. An updated feasibility cost sharing agreement will be required prior to restarting the study.

QUESTIONS FROM HON. PETER A. DEFAZIO TO MAJOR GENERAL SCOTT A. SPELLMON, DEPUTY COMMANDING GENERAL FOR CIVIL AND EMERGENCY OPERATIONS, U.S. ARMY CORPS OF ENGINEERS

Question 1. In WRDA 2016, we asked the Corps to establish an inventory of the nation's jetties and breakwaters. What can you tell us about the status of the study, especially for jetties located in the Pacific Northwest?

ANSWER. The report is under development.

Question 2.a. The Corps has provided us with data previously that all of the nation's navigation channels could be at full widths and depths in five years if the Corps was allocated $2.3 billion a year, over five years. The Committee has just reported by voice vote my bill, which would provide you with those funds.

If this bill was enacted into law tomorrow—and the Corps receives the funding, does the Corps have the capability to meet this goal?

ANSWER. No.

Question 2.b. If not, how do we ensure the Corps has the capability to execute additional navigation maintenance revenues when they are provided by Congress?

ANSWER. The Corps would need to increase its capabilities for contracting, surveying and dredging related activities associated with this increase in funding. The U.S. dredging industry may not have enough capacity to execute the dredging requirements. Buildup of the program, including additional dredging assets, would be necessary to address all of the dredging at every federal navigation channel.

Question 3. How many Federally authorized harbors is the Corps currently responsible for operations and maintenance (including maintenance dredging through the Harbor Maintenance Trust Fund)?

ANSWER. The current estimate is that there are 1212 Federally authorized harbors for which the Corps is responsible for operation and maintenance.

Question 3.a. Of those harbors, how many fall into the categories of high-use, moderate-use, and emerging harbors, as defined in section 210 of the Water Resources Development Act of 1986?

ANSWER. Navigation portfolio data pulled from the Navigation Data Center, included 58 high use channels, 79 moderate use channels, and 440 low use HMTF eligible harbors.

Question 3.b. Of those harbors, can you identify all of the Federally-authorized harbors that have received operation and maintenance funding (through the HMTF) over the last 20 fiscal years (and an estimate of the amount received by each)? For the remaining number of authorized harbors (those that have not received operation and maintenance funding over the past 20 fiscal years), what is the current general condition or status of these projects (e.g. are they still in use as commercial harbors)?

ANSWER. There is not currently available data to provide in regards to funding levels of authorized harbors over the last 20 years. All Federally-authorized navigation projects are maintained to support commercial navigation where it exists. I am not aware of any circumstance where a navigation project has been unable to support commercial navigation due to a lack of maintenance.

Question 3.c. What is the current identified unmet operation and maintenance needs for emerging harbors?

ANSWER. All emerging harbors have received sufficient operation and maintenance funding to allow passage of commercial traffic. While there are additional authorized widths and depths that could be dredged, we do not have a precise estimate of what amount of additional funding would be needed to meet that need. The Corps roughly estimates that $550 million would maintain all HMTF eligible low use commercial projects annually to their authorized widths and depths. Over the last 3 fiscal years, the Corps has received on average $223 million for coastal low use harbors. A large portion of the Corps low use portfolio includes channels that have diminished economic activity since their original authorization, therefore the Corps would not prioritize maintenance of every low use project. For this reason, any additional funding would focus on those low use projects, which in the absence of economic value, would provide other value to the nation such as by providing a means of fuel import for regional power generation, subsistence harbors or critical harbors of refuge uses, or support to the Coast Guard or other federal agencies, or other significant activities.

QUESTIONS FROM HON. GRACE F. NAPOLITANO TO MAJOR GENERAL SCOTT A. SPELLMON, DEPUTY COMMANDING GENERAL FOR CIVIL AND EMERGENCY OPERATIONS, U.S. ARMY CORPS OF ENGINEERS

Question 1. General Spellmon, WRDA 2018 reauthorized the Corps Dam Safety Program. This is an important program for the nation—but also to my district. What is the status of Whittier Narrows Dam? Are we on track to complete the project on time?

ANSWER. The Corps is coordinating with Federal and state agencies to complete the issuance of approvals and permits.

Question 2. The County of Los Angeles is very interested in taking ownership of parts of the Los Angeles River Flood Control system. The President's Budget provides funding for this disposition study, and we are hoping the work plan will fully fund the study. Can you discuss the Corps' disposition process generally and the next steps for the Corps and the County of Los Angeles for the L.A. River Flood Control Project?

ANSWER. The Corps Los Angeles District has been in discussion with the Los Angeles County Public Works (LACPW) regarding transfer of ownership and related operations, maintenance, and permitting of project modifications for the Los Angeles County Drainage Area (LACDA). The priority project features for the disposition study include approximately 40 miles of channels and the Haines Canyon Debris Basin.

The disposition process for a completed project operated by the Corps begins with a disposition study conducted under the authority of section 216 of the Flood Control Act of 1970 (33 USC § 549a). The current estimated cost of the LACDA study

is $1.25 million of which $350,000 was included in the FY 2020 Budget. If the disposition study determines that the project no longer serves its authorized purpose and that disposal of the associated infrastructure and real property is feasible, the Corps recommends to Congress that the project be deauthorized. Following enactment of legislation deauthorizing the project, the Corps proceeds with disposal of the associated infrastructure and real property under existing authorities for federal real property disposal or any special authority included in the deauthorization legislation for the project.

Question 3. Please provide the Committee with the following:

Question 3.a. A brief summary of the eight Chief's Reports submitted to Congress for authorization; and

ANSWER:

1) *Little Colorado River at Winslow, Arizona*. On December 14, 2018, a report was signed on flood risk management for Winslow, AZ. The plan consists of new and reconstructed levees, a flood warning system, and improving conveyance through channelization and removal of Salt cedar under the Burlington Northern Santa Fe Railway Bridge. Based upon the October 2018 price levels, the total initial project cost for this project is $79.1 million with the Federal share totaling $51.4 million and the non-Federal share totaling $27.7 million.
2) *Delta Islands and Levees, California*. On December 18, 2018, a report was signed for ecosystem restoration improvements in the Sacramento-San Joaquin Delta. Based upon the October 2018 price levels, the total initial project cost for this project is $25 million with the Federal share totaling $16.3 million and the non-Federal share totaling $8.7 million.
3) *Anacostia Watershed Restoration, Prince George County, Maryland*. On December 19, 2018, a report was signed for ecosystem restoration improvements in the Anacostia River Watershed. The plan consists of the restoration of aquatic habitat, through the removal of blockages, and the reconnection of restored habitat in the Northwest and Northeast Branches. Based upon the October 2018 price levels, the total initial project cost for this project, as recommended in the Chief's Report, is $34.1 million with the Federal share totaling $22.2 million and the non-Federal share totaling $11.9 million.
4) *Pawcatuck River, Rhode Island*. On December 19, 2018, a report was signed on hurricane and storm damage reduction for the Pawcatuck River, Rhode Island. The plan consists of elevating and flood proofing structures. Based upon the October 2018 price levels, the total initial project cost for this project, as recommended in the Chief's Report, is $54.6 million with the Federal share totaling $35.5 million and the non-Federal share totaling $19.1 million.
5) *Norfolk Coastal Storm Risk Management, Virginia*. On February 05, 2019, a report was signed on hurricane and storm damage reduction for the City of Norfolk, Virginia. The proposed plan includes constructing storm surge barriers with a pump and power station at Pretty Lake. The proposed work would tie into existing floodwalls and levees. Nonstructural features for the neighborhoods outside of the structural system include oyster reefs and living shorelines as natural and nature based features to increase resiliency. Based upon the October 2018 price levels, the total initial project cost for this project, as recommended in the Chief's Report, is $1.4 billion with the Federal share totaling $885.2 million and the non-Federal share totaling $476.6 million.
6) *Souris River Basin, Minot, North Dakota*. On April 16, 2019, a report was signed on flood risk management for the City of Minot, North Dakota. The plan consists of a diversion channel, earthen levee, a levee as a tieback and recreation trail connecting to an existing trail system. Based upon the October 2018 price levels, the total initial project cost for this project, as recommended in the Chief's Report, is $87.3 million with the Federal share totaling $56.7 million and the non-Federal share totaling $30.6 million.
7) *Brandon Road, Will County, Illinois*. On May 23, 2019, a report was signed for ecosystem protection improvements to impede upstream transfer of aquatic nuisance species at Brandon Road Lock and Dam in Will County, Illinois. The plan would consist of a flushing lock and an engineered channel, acoustic fish deterrent, electric barrier and an air bubble curtain. Nonstructural measures would primarily be implemented by other federal agencies and include public education and outreach, nonstructural monitoring, integrated pest management, pesticides, manual or mechanical removal and research and development. Supporting measures include two boat launches. Based upon the October 2018 price levels, the total initial project cost for this project, as recommended

in the Chief's Report, is $830.8 million with the Federal share totaling $540.0 million and the non-Federal share totaling $290.8 million.

8) *Yuba River, California*. On June 20, 2019, a report was signed for ecosystem restoration improvements on the Yuba River, California. The plan would consist of a restoring aquatic and riparian habitat along the lower Yuba River. Based upon the October 2018 price levels, the total initial project cost for this project, as recommended in the Chief's Report, is $97.2 million with the Federal share totaling $63.2 million and the non-Federal share totaling $34.0 million.

Question 3.b. Post-authorization change reports needing Congressional action, including any potential 902 modifications necessary before calendar year 2020.

ANSWER. The Corps has completed a disposition study for Willamette Falls Locks, Willamettte River, Oregon that recommends seismic repairs prior to transfer of the facility to a non-Federal entity. Based upon the October 2018 price levels, as recommended in the disposition study, is $2.827 million.

QUESTIONS FROM HON. EDDIE BERNICE JOHNSON TO MAJOR GENERAL SCOTT A. SPELLMON, DEPUTY COMMANDING GENERAL FOR CIVIL AND EMERGENCY OPERATIONS, U.S. ARMY CORPS OF ENGINEERS

Question 1. One of the Corps' main mission areas involves flood and storm damage reduction. The North central region of Texas suffers from significant flooding. How can the Corps develop national programs that focus on preventing flooding rather than being reactive and responding to flooding?

ANSWER. Flood and storm damage reduction is a primary mission for the Corps. The Corps currently has several national programs under which they provide flood risk hazard data and technical assistance to states and local communities to support their efforts to understand, reduce and prevent flooding. These programs include the Flood Plain Management Services, Planning Assistance to States, and Silver Jackets. The Corps also has the authority to study and construct flood and storm damage reduction projects of limited size and scope through Section 205 of the Continuing Authorities Program. Finally, the Corps conducts specifically authorized flood risk management feasibility studies through the Investigations program which can lead to the construction of specifically authorized projects that focus on preventing future flooding.

Question 2. How can the Corps share information of flooded areas with navigation technology providers to re-route drivers away from flooded roads and highways?

ANSWER. Local government agencies are responsible for managing and directing local evacuation plans during flood events. Any information on flooded roads would need to come from the local governments.

Question 3. Does the Corps have the authority it needs to address stormwater runoff, filtering stormwater, and recharge aquifers?

ANSWER. Stormwater runoff, filtering stormwater, and aquifer recharge are typically a local responsibility. However, Section 219 of WRDA 1992, as amended, provides authority to the Corps to carry out water-related environmental infrastructure and resource protection and development projects.

QUESTIONS FROM HON. GREG STANTON TO MAJOR GENERAL SCOTT A. SPELLMON, DEPUTY COMMANDING GENERAL FOR CIVIL AND EMERGENCY OPERATIONS, U.S. ARMY CORPS OF ENGINEERS

Environmental Infrastructure

Question 1. Some environmental infrastructure authorities have created regional programs for a state or multiple states. These programs can provide Corps assistance for multiple projects within the region. I have introduced legislation (H.R. 2206) to create a program for Arizona. Could you describe some benefits of a regional program to address water and wastewater infrastructure, such as flexibility to provide assistance to the most beneficial projects and meeting needs as they arise before performance and reliability are compromised, compared to environmental assistance authorities for a specific locality, such as the assistance under the 219 authority?

ANSWER. [Editor's note: Major General Spellmon did not respond to this question. However, Hon. James responded to this question from Hon. Stanton above.]

Rio Salado Oeste

Question 2. Rio Salado Oeste in the Salt River through the heart of Phoenix is a key Corps project that connects the completed Rio Salado Habitat Restoration

Area to the east with the Tres Rios Environmental Restoration project to the west. To date, this project only has partial design completed. A Limited Re-evaluation Report (LRR) is needed to re-authorize this project and move this important connecting project forward. Can you please provide me with a plan on how best we move forward with a revised LRR for this project, the resources needed, and how those resources will be allocated within the Corps to create this report and any other steps necessary to obtain project authorization.

ANSWER. [Editor's note: Major General Spellmon did not respond to this question. However, Hon. James responded to this question from Hon. Stanton above.]

QUESTIONS FROM HON. GARRET GRAVES TO MAJOR GENERAL SCOTT A. SPELLMON, DEPUTY COMMANDING GENERAL FOR CIVIL AND EMERGENCY OPERATIONS, U.S. ARMY CORPS OF ENGINEERS

Question 1. The Bonnet Carre Spillway has been opened four times in the past four years for the first time in history, and, also for the first time, twice in one year. There are clearly large-scale factors that are challenging the normal operating procedures of managing the Mississippi River. The Water Resources Development Act of 2018 (WRDA 2018; Title I of America's Water Infrastructure Act of 2018; P.L. 115–270) required a report to Congress on structure and operations plan for the Old River Control Structure and how it can be best optimized to manage the Mississippi, Atchafalaya, Red, and Old Rivers. As I understand it, the Corps will not be completing that report but is instead completing a three-year "Old-Mississippi-Atchafalaya-Red Rivers" (OMAR) study. I am deeply concerned that a three-year study does not carry the urgency of addressing how to better manage what is currently an annual and predictable emergency.

Question 1.a. What is the status of funding for the OMAR study?

ANSWER. The Corps allocated Fiscal Year 2019 funds to initiate the OMAR Assessment.

Question 1.b. What are the study's intended objectives?

ANSWER. The intended objectives of the OMAR Assessment is to: evaluate operations at the Old River Control Structure (OCRS) with a focus on the Mississippi and Atchafalaya rivers; calculate the current volume of sediment and water passing through ORCS, including potential changes to those volumes; and evaluate if operational changes at ORCS are advisable to ensure that the MR&T System can safely pass the project design flood into the future. The OMAR Assessment will consider the operation of the Sidney A. Murray Jr. Hydropower Plant and its impact on, and capability for, sediment distribution, as well as other upstream and downstream impacts and opportunities in the project area.

Question 1.c. Will the study contain actionable items for the Corps and for Congress to improve management of these river systems?

ANSWER. It is too early in the technical assessment to determine if any actionable items will be recommended to Congress.

Question 2. The Corps just recently released guidance for section 1043 of the Water Resources Reform and Development Act of 2014 (P.L. 113–121).

Question 2.a. Could you describe your experiences with the section 1043 program and explain how the Corps will operate the provision moving forward?

ANSWER. Two project have proceeded utilizing Section 1043:

1. *Clear Creek, TX*. A Project Partnership Agreement was executed between the Department of the Army and the Harris County Flood Control District for the Clear Creek, Texas Flood Risk Management Project in June 2019.
2. *McCook Reservoir*. The Project Partnership Agreement for Phase II of the McCook reservoir project was executed in January 2019.

If Section 1043 is amended by Congress to allow the commencement of new projects, the Corps will continue to execute the program in accordance with the law.

Question 3. Many of my colleagues on both sides of the aisle have lauded how the Section 1043 program will allow the Corps and non-Federal partners to remove major liabilities from the Corps' $100 billion backlog in authorized projects.

Question 3.a. Why does the Corps interpret the program to have expired if WRDA 18 specifically authorizes an extension of appropriations through 2023?

ANSWER. Section 1043(b)(7) of WRRDA 2014 provides that the authority to commence a project under Section 1043(b) terminates June 10, 2019. Section 1137 of WRDA 2018 amends the provision to authorize appropriations of $25M for each of the fiscal years 2019 through 2023. Section 1137 does not amend subsection (b)(7) terminating the authority to commence new section 1043 projects after June 10, 2019. Thus, Section 1137 allows 1043 projects that were commenced prior to June

10, 2019, to continue to receive funds (i.e. McCook, and Clear Creek) through 2023, but it does not allow for the commencement of new projects under Section 1043 after June 10, 2019.

Question 3.b. Will you commit to reassessing the interpretation of this technical error as our intent was clearly to reauthorize this program through 2023?

ANSWER. A technical correction or amendment is required to be enacted in law to extend this authority. The FY 2020 and FY 2021 Budgets propose legislative language to extend the provision:

> "Section 1043 of the Water Resources Reform and Development Act of 2014 (33 U.S.C. 2201 note; Public Law 113–121) is amended—In subparagraph (b)(7), by striking "5 years" and inserting "10 years"."

Question 4. As you know, non-federal sponsors are required to obtain various levels of interest in real property for cost-shared projects. However, the requirements of real property acquisition are inflexible to the unique characteristics of individual projects. In Louisiana, at least 80% of coastal wetlands are privately owned and must work cooperatively with the non-federal project sponsors to acquire real estate interests that balance the rights of private land owners with the needs of the federal government. Section 1115 of WRDA 2018 was intended by Congress to allow more flexibility in the required level of interest in property to complete a project and to allow better cooperation with non-federal interests, including private landowners. The provision specifically directs the Corps to "first consider the minimum interest in real property necessary to support the water resources development project for which such interest is acquired," such as a temporary easement or other interest which "reduce[s] the overall cost" and "reduce[s] time to complete such project, and minimize conflict with property owners related to such project". Despite the language included in WRDA 2018, the guidance issued to implement this section reaffirmed the Corps' existing guidance, ER 405–1–12, Chapter 12, which was last updated in 1998.

Question 4.a. Could you describe any re-evaluation of Chapter 12 Regulations following the passage of WRDA 2018 and explain why this guidance was not altered considering the directives of Section 1115, especially as several requirements included in that section are not listed factors of consideration in Chapter 12 Regulations.

ANSWER. The minimum estates set forth in ER 405–1–12, Chapter 12, were coordinated with the Department of Justice and represent the typical minimum estates for the various types of projects listed there, and are the default and standard estates. However, both Chapter 12, and Revised Real Estate Policy Guidance Letter 31, January 11 2019, provide a process for proposing a non-standard estate when such an estate will support project requirements given the project and its unique characteristics. Chapter 12 is currently in the revision process, and comments are being solicited from the field as proposed changes to, among other things, the minimum estates. Any changes in the minimum estates will require, as before, coordination with the Department of Justice to ensure that the federal investment is protected and landowners are treated equitably and fairly. The federal government already requires, as does Chapter 12 and revised Real Estate Policy Guidance Letter 31, that the minimum estate necessary to support the project be acquired.

Question 4.b. Does the Corps plan revisions of Chapter 12 in light of the Congressional mandates set forth in Section 1115?

ANSWER. Chapter 12 is currently in the revision process, and comments are being solicited from the field as proposed changes to, among other things, the minimum estates.

Question 5. Subsection (c) of Section 1115 of WRDA 2018 specifically requires the Secretary to consider procedures to acquire or require acquisition of interest in land used by a State.

Question 5.a. Why does the Corps hold that "statutory restrictions" alone cannot be justification for lesser property interests, particularly if the policy behind the adoption of such local restrictions is based on sound policy and in consideration of all factors set forth by Congress in Section 1115?

ANSWER. The minimum estate necessary for a project depends on the project, its requirements and the minimum land interest necessary in order to support the project. Although a state could certainly require that a greater interest in land be obtained within its boundaries than is necessary to support the project, credit for providing that interest would still depend on federal law and regulations. State legislation cannot require that a lesser interest than is actually the minimum necessary to support the project be sufficient for a federal project.

Question 5.b. What procedures does the Corps have in place to determine what other criteria must be met by a non-Federal sponsor to justify deviation based on a statutory restriction?

ANSWER. While state law restrictions and sponsor preferences are taken into account when determining the minimum interest required for a project or feature, the Corps cannot approve an interest as the minimum interest unless it grants sufficient rights, both in scope and duration, to construct, operate, maintain, repair, rehabilitate and restore the project or feature and provides adequate protection to the project or feature from incompatible uses.

Question 5.c. Has the Corps considered whether such policy essentially writes state laws off the books and how this might jeopardize the Corps' ability to deliver projects or cooperate fully with non-federal sponsors who have property acquisitions laws that provide no real impediment to the implementation of projects?

ANSWER. State law restrictions inconsistent with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, or that affect non-federal sponsors legal capability to acquire the minimum required real property rights for the project may have the effect that under state law the necessary minimum land interest to support a federal project cannot be obtained. The federal government already requires, as does Chapter 12 and revised Real Estate Policy Guidance Letter 31, that the minimum estate necessary to support the project be acquired. State legislation cannot reduce that requirement.

Question 5.d. Has the Corps adopted any policy, written or otherwise, for the handling of developing standard or non-standard estates in compliance with Section 1115 mandates and working with non-federal sponsors to conform to state policies and laws regarding land acquisition per Section 1115? Could you provide a written copy of this policy? If not, please explain why and explain whether the Corps intends to adopt such policy in the future.

ANSWER. No. Any changes in the minimum estates will require coordination with the Department of Justice to ensure that the federal investment is protected and landowners are treated equitably and fairly. Chapter 12 is currently in the revision process, and comments are being solicited from the field as proposed changes to, among other things, the minimum estates.

Question 6. In a February 12, 2019, letter addressed to Lieutenant General Semonite, the State of Louisiana specifically noted concerns with Chapter 12 guidance because of its inflexibility to the needs of individual projects, notwithstanding the fact that the guidance was last updated in May 1998.

Question 6.a. What did the Corps do to address the comments made by the State of Louisiana through its Coastal Protection and Restoration Authority relative to Section 1115?

ANSWER. The implementation guidance issued for Section 1115 takes into account the comments from the State of Louisiana through its Coastal Protection and Restoration Authority.

Question 6.b. Are the state's comments addressed in the implementation guidance for Section 1115?

ANSWER. The implementation guidance issued for Section 1115 takes into account the comments from the State of Louisiana through its Coastal Protection and Restoration Authority.

Question 7. The State of Louisiana also submitted comments on other sections of WRDA 2018, including Sections 1111, 1116, 1120, 1143 and 1176.

Question 7.a. What effort has the Corps made to address those comments and incorporate them into the implementation guidance for WRDA 2018?

ANSWER. Comments received from stakeholders during the public input period including the comments provided by the State of Louisiana related to the listed provisions were considered as appropriate while drafting the implementing guidance.

QUESTIONS FROM HON. THOMAS MASSIE TO ROB INNIS, PLANT MANAGER, SPARROWS POINT, MARYLAND, LAFARGEHOLCIM, ON BEHALF OF WATERWAYS COUNCIL, INC.

Question 1. In your testimony you mention that if you were to ship your commodities by truck it equates to over 365,000 additional trucks on the road. The locks on the river system are getting up there in age. What is something that Congress could do in the upcoming WRDA bill to ensure that this critical freight shipping option is available for years to come?

ANSWER We believe the most important policy change to be included in the Water Resources Development Act of 2020 is changing the cost share for new Construction and Major Rehab of Inland Waterway Trust Fund (IWTF) supported projects from

the current cost share of 50% General Treasury and 50% IWTF, to 75% General Treasury and 25% IWTF. We believe this would be the best value to the Nation based on what has achieved since 2015.

Thanks to the good work of the T&I Committee, WRRDA14, contained a cost share changed for the remaining cost of the Olmsted project, from 50% General Treasury and 50% IWTF, to 85% General Treasury and 15% IWTF, which allowed for efficient funding to flow for our priority projects the last six fiscal years. Since FY2015, we have seen an about $400 Million per fiscal year appropriated to IWTF projects. Also in the FY2019 Appropriation package there was a one-time change in the cost share of the Chickamauga project from 50% General Treasury and 50% IWTF, to 85% General Treasury and 15% IWTF.

As a result of these cost share changes, we have seen the cost of completion decrease along with the projects becoming operational sooner. Some examples below:

- Olmsted Lock and Dam: Post Authorized Cost Report $3.099 Billion, the USACE Cost Estimate at Completion is $2.841 Billion, a cost reduction of $258 Million.
- Lower Monongahela Project: Authorized at $1.23 Billion, the USACE Cost Estimate at Completion is $1.09 Billion, a cost reduction of $221 Million.
- Kentucky Lock Project: Authorized at $1.216 Billion, the USACE Cost Estimate at Completion is $1.048 Billion, a cost reduction of $168 Million.
- Chickamauga Lock Project: Authorized at $758 Million, the USACE Cost Estimate at Completion is $669 Million, a cost reduction of $89 Million.

As you can see efficient funding, has led to an estimated cost reduction of approximately 12%, or $736 million below authorized cost of these four projects.

The National Economics Benefits (NEB) for these projects being completed sooner. Once these projects are operational the country receives the economic benefits sooner.

- Olmsted Lock and Dam: $600 Million per year Net Benefits × 4 years equates to $2.4 Billion net benefits that we can realize.
- Lower Monongahela Project: $220 Million per year Net Benefits × 4 years equates to $880 Million net benefits that we can realize.
- Kentucky Lock Project: $100 Million per year Net Benefits × 4 years equates to $400 Million net benefits that we can realize.
- Chickamauga Lock Project: $21 Million per year Net Benefits × 4 years equates to $84 Million net benefits that we can realize.

By changing the Cost share to 75% General Treasury and 25% IWTF we could realize a cost savings of $736 Million on these projects along with an annual Net Benefits of $3.764 Billion.

Thanks again for the opportunity to clarify the reasoning for changing the cost share, on IWTF projects from 50% General Treasury and 50% IWTF, to 75% General Treasury and 25% IWTF. We believe these results are the best value to the nation.

QUESTIONS FROM HON. GARRET GRAVES TO DEREK BROCKBANK, EXECUTIVE DIRECTOR, AMERICAN SHORE AND BEACH PRESERVATION ASSOCIATION

Question 1. Natural infrastructure is a key component of our defense system in Louisiana, where we are losing a football field of land every 100 minutes due to leveeing the Mississippi River, subsidence, erosion, and sea level rise. Our coastal networks of barrier islands and wetlands provide a critical line of defense for our communities, working as a complement to traditional levees and other flood infrastructure to keep communities safe.

Question 1.a. What are the benefits and hurdles of using natural infrastructure alongside or instead of built, hard infrastructure?

Question 1.b. Do you have any policy or process recommendations to ensure smooth coordination between the Corps and non-federal sponsors when working to restore and enhance natural infrastructure along the coast?

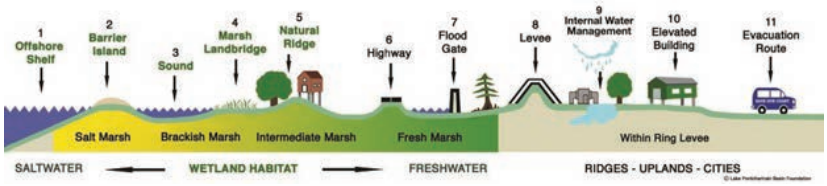
ANSWERS (a.–b.):

Natural infrastructure is a key component of coastal risk reduction across the United States and the world. "Ecosystem-based approaches to reduce risks from coastal storms, approaches which draw from the capacity of wetlands, beaches and dunes, biogenic reefs, and other natural features to reduce the impacts of storm surge and waves" have increased in prominence across the country.[1]

[1] Bridges, T, et al. "Use of Natural and Nature-Based Features (NNBF) for Coastal Resilience", ERDC SR, 15–1; 2015. https://erdc-library.erdc.dren.mil/xmlui/handle/11681/4769

American Shore & Beach Preservation Association (ASBPA) is pleased to see greater support for and understanding of the way natural systems reduce risk for coastal communities, but we understand natural infrastructure alone cannot solve our nation's coastal flood risk, and there are challenges to using natural infrastructure in combination with "traditional" hard infrastructure exist. Additionally, the U.S. Army Corps of Engineers (USACE) has a central role in building and restoring natural infrastructure, but so do local communities, and healthy coastlines and efficient project delivery will take USACE coordinating well with local sponsors stakeholders.

a. Natural infrastructure is most effective when used as part of a Multiple Lines of Defense strategy, where ecologically based flood and coastal storm risk reduction is combined with non-structural and structural solutions to keep people and property safe from coastal hazards.



Multiple Lines of Defense. Courtesy of Lake Pontchartrain Basin Foundation

Natural infrastructure can provide multiple benefits to communities, including a) protection, b) ecologically valuable habitat, c) economic vitality, and d) recreation, as outlined in ASBPA's written testimony.[2] The ecological, economic and recreation components are particularly important because this is what natural infrastructure provides that hard infrastructure cannot. Restoring the natural functions of a shoreline and the corresponding community benefits should not be treated as *lagniappe*—a little free bonus—on a flood protection project, it should be part of the central purpose of a project.

Additionally, natural infrastructure can provide protection to hard infrastructure by extending its lifespan. For example, a dune system with a structural (seawall) buried core, may be designed for the dune to withstand a 10-year coastal storm event and the core to withstand a 100-year coastal storm event. The structure integrity of that seawall is likely to last longer since it is not exposed to ongoing corrosive effects of saltwater, wind and waves except for when it's exposed during coastal storms greater than 10-year events.

Harder to quantify, but also important are the esthetic and safety enhancements natural infrastructure can provide in supplementing hard infrastructure. For example, even if a seawall provides a community all the flood protection it needs, an exposed seawall adjoining a beach can be considered an eyesore and can be dangerous for beach-goers to cross or for children to play on. A dune system will maintain the beach characteristics that define the community and that residents and tourists expect.

However, there are challenges to combining natural infrastructure with hard infrastructure. Most prominently is how hard infrastructure can, if not designed properly, negatively impact the viability of natural infrastructure. For example a seawall or bulkhead can exacerbate the erosion of beach or marsh directly in front of it, due to the reflection of wave energy hitting the structure. Even a buried wall will adversely impact the beach and dune system as soon as it becomes exposed. Similarly, a levee system that restricts interchange of fresh and saltwater can fundamentally change the hydrology of a coastal marsh system, accelerating marsh loss, changing locations of oyster reefs and other biologically based natural infrastructure that has a narrow salinity gradient.

b. One of the biggest structural challenges USACE has in coordinating with local project sponsors is its project-based budgeting system. Unique among federal agencies, USACE has a budget based nearly entirely on project delivery, with very little programmatic or unallocated staffing funds. Theoretically, this could help focus the USACE to achieve projects. However, in ASBPA's experience, we have found that this style of budgeting has led to a) an inability for USACE to work with local sponsors in the early stages of project development; b) challenges for USACE in working

[2] Brockbank, D. "Transportation & Infrastructure Committee Hearing Testimony, July 10, 2019", July 10, 2019 http://asbpa.org/wpv2/wp-content/uploads/2019/07/TI-Hearing-Testimony__Final__ASBPA__Brockbank.pdf

with local sponsors and stakeholders once a project (or study) is authorized if it is not funded, and c) USACE staff that could best be utilized to do outreach and coordination with locals being "tied" to projects, rather than learning from local communities.

USACE has an incredible wealth of technical knowledge and expertise, but too often this cannot be accessed by non-federal sponsors, unless they are actively working on an authorized and funded federal project, or have requested support through one of USACE's small "technical assistance programs".

Similarly, USACE staff have challenges in providing insight and guidance on locally funded natural infrastructure projects, other than through the permitting and regulatory process. Local projects, from small living shorelines, to major coastal land-rebuilding projects could benefit from USACE's engineering review—particularly when they are adjacent to and/or impacted by federal projects. USACE can sometimes work this type of coordination into the project cost of an existing project, particularly if a locally funded project is likely to interact with a federal project, but that can appear to drive up the cost of the federal project when the real benefit is to the local project.

Unfortunately, at this time ASBPA does not have specific recommendations for how to address this issue. Changing the USACE budget process is incredibly complicated with many potential operational challenges. We encourage the Transportation & Infrastructure (T&I) committee to consider how budgeting plays a role in the USACE's coordination with local sponsors and stakeholders, and consider structural changes to improve the budgeting process. As the Committee develops policy ideas, ASBPA would be honored to review and make recommendations for how we believe those policies would play out for coastal projects.

Finally, the current interpretation of the "Federal Standard" has proved challenging for coordination between the Corps and non-federal sponsors when working to restore and enhance natural infrastructure along the coast. Local project sponsors who are taking the long view of managing sediment and know that future ecosystem restoration and natural infrastructure projects will need sediment, are too often prevented from beneficially using sediment dredged by USACE. Local sponsors are stymied by USACE interpretation of least coast disposal, that only looks at current costs, and doesn't calculate the value of the sediment (or the "opportunity cost" of beneficial placement) when disposing of dredged material. The solution here is not to fundamentally change or get rid of the federal standard, but to ensure it is being implemented in a way that considers all future costs for sediment needs that could otherwise be saved by beneficially using dredge material rather than dumping it offshore.

Thank you for the questions and we look forward to working with the committee to support Natural Infrastructure in a 2020 Water Resources Development Act and other legislation coming from the T&I Committee.

QUESTIONS FROM HON. GRACE F. NAPOLITANO TO F. MARTIN RALPH, PH.D., DIRECTOR, CENTER FOR WESTERN WEATHER AND WATER EXTREMES, SCRIPPS INSTITUTION OF OCEANOGRAPHY, UNIVERSITY OF CALIFORNIA SAN DIEGO

Question 1. One of the sites being considered by your organization is Prado Dam in my region. I also know that all sites are different. What are the lessons learned from Lake Mendocino, and how can you apply that to other reservoirs, like Prado?

ANSWER. The Lake Mendocino FIRO project has taught us many lessons that will help us evaluate the potential viability of FIRO at other reservoirs.

a. If storms that have the potential to produce flooding on the Russian River can be predicted well enough 3–5 days ahead, then there is potential for 10,000+ acre feet of water to be safely retained behind the dam, pending a 5-day forecast of such a storm. This is enough water for 10's of thousands of households for a year.
b. Floods on this river are cause by atmospheric river storms, and there is enough skill in predicting the inflow into Lake Mendocino from the precipitation produced by an atmospheric river, that FIRO could be used to provide enhanced water supply reliability without adding flood risk. Preliminary tests suggest that FIRO may also be able to improve flood protection by encroaching into the water supply ("conservation") pool ahead of a storm.
c. Tools, including a prototype decision support system, have been created for Lake Mondocino that show the risk of an atmospheric river striking the region, and of inflow into the reservoir reaching a point that requires release of some of the extra 10,000+ acre feet of water ahead of the storm. With 5-days lead time, this water released would have moved downstream to the ocean, out of

harms way and restoring the full flood pool in case it is needed for the incoming storm.

d. The formation of a steering committee that includes both water supply operators, flood control operators, regulators and scientists, charged with developing a workplan to carry out a FIRO viability assessment can successfully integrate weather, hydrology and climate science with engineering, water management and environment expertise to carry out the necessary studies to assess the viability of FIRO at that reservoir. And that such a committee can develop a culture that enables all perspectives to be heard and to make rapid progress on the technical problems.

e. Such a committee can develop enough credibility that it can prepare and submit a major deviation request that passes full review by USACE and is carried out as a test.

All of these lessons apply to Prado Dam, although vital characteristics differ from lake Mendocino and require detailed technical evaluations. These include the reservoir purpose being primarily for flood control and being located in an urban area with many people in the flood plain, whereas Lake Mendocino is rural and has both a flood control and a water conservation pool. Endangered Salmon are a concern for Lake Mendocino, while bird species are the primary environmental issue at Prado. The Prado watershed is shorter in length, steeper, and significant areas are covered by manmade impervious surfaces. Some tools developed to improve weather forecasting for the Lake Mendocino area will also prove useful in the region surrounding Prado Dam, and elsewhere on the west coast, although additional tailoring of the forecasting tools and associated decision support system for each watershed will be required. Improved weather forecasting will benefit water management throughout the state. Prado Dam is being modified to substantially increase its flood control capacity and FIRO can feed into a water control manual update that will be needed anyhow due to the dam modifications.

Question 2. Why is forecast informed reservoir operations important to consider, especially in the west?

ANSWER. Precipitation prediction has long been one of the toughest challenges in weather forecasting and was not at a level of skill that could justify its consideration in operating major reservoirs. Thus, historically, most major reservoirs have been operated based on rules focused on "water on the ground," i.e., in snowpack, streams, rain gauges or reservoirs, but not on weather forecasts. However, over recent decades, weather prediction skill has advanced substantially. Enough so to warrant consideration of the potential that now there is enough skill in precipitation and streamflow forecasting that operations at some reservoirs could safely consider them in day-to-day operations. In addition, or possibly partly in response to this improvement in forecasting, the USACE recently updated its water management engineer regulation to allow for the possible use of forecasts in operations. These developments have opened the door to explore the possibility of using skillful weather forecasts to enable reservoir operations decisions that could both increase water supply reliability (without increasing flood risk), as well as increasing flood mitigation capacity (without decreasing water supply reliability), while also improving environmental outcomes.

The Western US experiences far more year-to-year variations in annual precipitation than elsewhere in the nation, and yet also is home to some of the most arid and yet also agriculturally productive, lands in the nation. The West is home to both thriving economies and diverse ecosystems that are at risk due to water supply reliability issues and to flood. The modern water management system does a remarkable job in supporting these. In some years this system still struggles when there is either too much or too little precipitation, i.e., drought or flood. Variations that are projected to become increasingly common and extreme as climate changes, thus increasing vulnerabilities and making FIRO a potentially useful climate adaptation method. Not only are the potential benefits of FIRO in this region immense, it so happens that forecasts of the heaviest precipitation events are more skillful in the West (during the wet winter season) than anywhere else nationally. Science has determined that atmospheric river storms are the cause of most major flooding in the West and can provide 25–50% of the annual precipitation each year. This allows science to focus on making better observations and forecasts of this type of storm, specifically. Offering true potential for predictions to reach a level of skill that can enable FIRO to be viable at some reservoirs, at least those with suitable characteristics and operating conditions.

QUESTIONS FROM HON. JOHN GARAMENDI TO F. MARTIN RALPH, PH.D., DIRECTOR, CENTER FOR WESTERN WEATHER AND WATER EXTREMES, SCRIPPS INSTITUTION OF OCEANOGRAPHY, UNIVERSITY OF CALIFORNIA SAN DIEGO

Question 1. Could you please describe Scripps research work with the Yuba Water Agency and California's Department of Water Resources? Specifically, can you please explain how this work will complement California's and Scripps' work with the Army Corps of Engineers on the Forecast Informed Reservoir Operations program, and Yuba Water Agency's plans to build the new secondary spillway at their dam, New Bullards Bar Dam and Reservoir?

ANSWER. Scripps has begun working with Yuba Water Agency (YWA) and California Department of Water Resources (CDWR) to develop a technical workplan to assess the potential viability of FIRO on the combination of New Bullards Bar on the Yuba River (operated by the Yuba Water Agency) and Oroville Dam on the Feather River (operated by CDWR). Information derived from the FIRO work is envisioned to provide substantive input into updating the New Bullards Bar USACE Water Control Manual, which was issued in 1972, and this update is expected to provide support for potential benefits created from the construction of the New Bullards Bar Secondary Spillway. (Background information from YWA regarding the purpose and status of the secondary spillway is provided at the end of this reply).

These rivers merge just downstream of the town of Marysville, which is in the region of substantial historical floods in 1955, 1986 and 1997. The project brings local, state and federal agencies together in a steering committee to plan and execute an effort that applies research and innovation to enhance flood protection and aid water management. The project will extend experience with FIRO to include the complexities introduced by including two reservoirs, working in a region influenced strongly by snow and snowpack and that is located well inland from the coast. These factors, along with the sheer size of these reservoirs and the fact they are "Section 7" reservoirs (i.e., not directly operated by USACE, but where USACE has a key role in updating their water control manuals), differ substantially from conditions at Lake Mendocino and Prado Dam, where FIRO studies are underway. Thus, the Yuba-Feather FIRO project will extend the range of conditions explored with USACE in terms of the potential applicability of FIRO. In addition to developing the workplan, a handful of preliminary technical studies are starting, including research on the extreme storms that drive floods in the region, the role of snowmelt in such flooding and soil moisture impacts on flow.

The development of a new spillway for New Bullards Bar, and the changes at Oroville that could be triggered from its Comprehensive Needs Assessment, each will require updates to their respective water control manuals, a step involving USACE. A strategy of the Yuba-Feather FIRO effort being envisioned is for it to produce outputs that can feed directly into these water control manual updates that would incorporate adaptive management methods informed by forecasts. Such an update would be intended to introduce greater flexibility for both enhanced flood mitigation capacity, as well as increased water supply reliability, while benefitting ecosystems (see response to the second QFR from Chairwoman Napolitano for a brief description of how FIRO works more generally to achieve such goals).

The following is background information provided to me by Yuba Water Agency regarding the secondary spillway:

> "*As a result of the devastating 1986 and 1997 Yuba County floods resulting in the loss of life and destruction of property, Yuba Water Agency has spent two decades studying and making decisions on how to improve flood protection in Yuba County. The result has been a decision to build a Secondary Spillway that will enable earlier release of flood waters entering the reservoir so that there is more flood space to handle the peak flood flow. This will result in lower downstream flow, thus improving flood protection. Additional benefits include a totally independent redundant spillway that can handle the flood of record in case the primary spillway is inoperable, the capability for having higher storage in dry periods that can enhance water supply and the Secondary Spillway will enhance dam safety of New Bullards Bar Dam, which is the 5th tallest in the US. The YWA board has authorized $11 million for the design and permitting of the Secondary Spillway and the plan is to complete construction by 2025. In this era of climatic change, the Secondary Spillway is the best way YWA can improve climatic resiliency for the people of Yuba County*."

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