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TESTIMONY

Concepts for the Next Water Resources Development Act: Promoting Resiliency of our Nation's Water Resources Infrastructure

Before the
Subcommittee on Water Resources and Environment
House Transportation and Infrastructure Committee

By

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Introduction

The Association of State Floodplain Managers (ASFPM) appreciates the opportunity to share our views and ideas for potential improvements in programs of the U.S. Army Corps of Engineers (Corps) that would help increase the resiliency and long-term health and productivity of our nation's water resources infrastructure as the Committee prepares to develop a 2020 Water Resources Development Act (WRDA).

The 19,000 members of ASFPM and our Chapters are partners of the Corps, Federal Emergency Management Agency (FEMA) and many other federal agencies along with those 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 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.

Recent experience continues to demonstrate that the increasing variability and frequency of intense weather events and conditions, along with intensifying watershed development and aging water infrastructure underscore the need for new thinking and approaches to reduce vulnerabilities and increase resilience. 2019 is the fifth consecutive year (2015-2019) in which 10 or more billion-dollar weather and climate disaster events have impacted the United States, according to the National Climatic Data Center of NOAA. The NCDC identifies some 254 such events having occurred since 1980 with a cost of more than \$1.7 trillion. Floods are – and continue to be – the nation's most frequent and costliest disasters 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 and local sponsors 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 and costs.

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 address 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. According to the Congressional Research Service ([CRS](#)) from FY 2005 – FY 2018 Congress spent nearly twice as much (\$44 billion) on recovery from flooding and other natural disasters as from regular annual appropriations for flood-related activities (\$23 b). 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 guidance and 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, which is underway or forming in virtually all the states, 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](#) 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 to the local and state level. However, it is still nearly impossible to leverage Corps expertise on more than an ad-hoc basis, and not associated with a particular Corps project. While Silver Jackets has somewhat helped this at the state level, 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 38 districts which contribute to the Civil works mission, 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 to help locals and states accomplish their role of flood loss reduction.

The [Floodplain Management Services](#) (FPMS) 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.

ASFPM believes that programs such as FPMS, PAS, and Silver Jackets – that are designed to provide engineering and scientific assistance to communities and states on a collaborative basis – are a critical key to fostering and developing local and state resilience planning capacity that should be a key goal for Corps transformation in the area of flood damage reduction and floodplain management into the 21st Century. These programs have been shown to provide significant benefits for a relatively small investment. 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 so they can implement the various options they have for reducing the hazard. These approaches and options can be structural, nonstructural, or a combination of the two and can often lead to less expensive and more resilient and 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 work on them vigorously and others do not. We know through 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 exceed available resources, but the funding does not always get to the districts who have activities that will expend the funds and help communities and states. 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 (meaning they cannot proceed unless they have a project to charge their time) versus making the technical assistance more broadly and widely available. A special focus in the next WRDA should be to make such technical assistance more readily available to help disadvantaged and impoverished communities plan for reducing flood risk, increasing flood resiliency, and improving flood risk management.

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 had 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 could serve to substantially expand the Corps' contribution to enhancing water resources resilience and sustainability, and should be authorized and funded at least at \$50 million annually.**

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. This is also where the locals and states could proceed using funds outside of federal taxpayer funds. A number of states have their own mitigation grant programs, and working collaboratively with USACE expertise to fit actions within a comprehensive watershed and resilient manner could greatly benefit flood loss reduction in the nation.

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) 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 Corps 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-benefits, working with natural processes 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). 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 to specify use of appropriate products that would avoid the failures we saw in the Midwest in 2019. 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 resistant 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. This is especially of concern, given the increasing intensities and impacts of storms and flooding events being experienced in many communities and regions across the nation. Nonstructural and nature-based flood risk management approaches are often capable of buffering and withstanding these impacts with far lower overall cost, while providing major economic, societal, and environmental benefits. While the Corps 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 often been well-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 and state 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 programs whether it be through PL 84-99 or as a result of the Principles and Guidelines or current cost-sharing policies. Yet, the array of adaptation techniques that coastal and inland communities will need to respond to increasing risks and changing conditions 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 and could be done in combination with a structural measure. ASFPM encourages the Corps to identify and remove systemic biases against nonstructural, flood-risk reduction measures and elevate the status of such measures strategically.

Authority to study Missouri River flood management system.

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 at 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 (room for rivers) or removed and to see if other mitigation options like buyouts or elevation of buildings, which would be more effective and less costly, could be employed. Such a study is needed to help guide major repair and rehabilitation, in particular, in response to changing water conditions in the Missouri Basin and to evaluate improved floodplain management, storage, and flood conveyance solutions for large floods and runoff events. We believe the Corps and basin management would benefit from broad based evaluations in many instances

where increasing flooding is occurring or can be calculated. 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 and resilience. 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 states 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 (barrier testing) 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 the seeming lack of 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, and 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](#) led by General Gerald Galloway after the 1993 Mississippi River floods. One recommendation never enacted was a new law to define the flood risk management responsibilities of federal, state and local governments, including the levee districts that build and maintain locally-funded levees. This could best be done by directing the Federal Interagency Floodplain Management Task Force (FIFM-TF) to do it.

Despite enormous public investment in flood “control” structures, this spending has been outpaced by development in risky areas and development in the watersheds that increases runoff and flooding, resulting in 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 a further distance 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 of flood storage and conveyance as well as providing valuable habitat.**

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 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 (such as hospitals, schools, fire stations, police stations, storage of critical records, etc.) 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 communitywide 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) and [National Inventory of Dams](#) (NID). 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 to the 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](#) 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-Hurricane 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 better guide development and 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 publicly available. Why would we be withholding this vital information on flood risk? The ASFPM would urge clarification in the next WRDA that identification of potential inundation areas from levee or dam operation or failures should be made widely available to help inform the public in making a wide range of economic and life-safety decisions and plans.

The above policy seems to be an artifact from 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 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 Congressional requirements that such areas be shown on Flood Insurance Rate Maps and on publicly-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 federal 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 publicly available.**

Let's not have a recurrence of the Oroville dam situation from a couple years ago where a 190,000 people were told to evacuate very quickly because the dam's integrity was threatened, and none of them had been told or 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, yet this may be among the most important issues to help many communities consider and develop effective flood risk management and infrastructure resiliency. 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 federal 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 do 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](#) with 20 recommendations made in 2009. The [2014 WRRDA](#) 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 programs 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, and the Senate Appropriations Committee has reported a similar level. While it does not fund the program at its full authorization of \$79 million, it does provide \$15 million.

- **ASFPM recommends full implementation of the National Levee Safety Program and require 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 a new 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 maintenance 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 are safe and do not have a false sense of security that the levee will protect them. The authorized Corps Levee Safety programs need 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 even 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. Gen. Spellman indicated that changes to any one levee on the system could cause more problems downstream, or across the river.

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 PL 84-99

PL 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, PL 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 PL 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. PL 84-99, which is the principal 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 PL 84-99, has been on-again-off-again process of being under consideration for updating for several years. ASFPM believes that it is essential this guidance be updated and 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. PL 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 PL 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 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.**

Data and Information on PL 84-99 costs and repetitive levee and flood control repair/rehabilitation costs.

In addition, ASFPM is concerned that we have seen no work products nor results, despite Congress' direction in Section 3029 of WRDA 2014 that the Corps of Engineers should provide reports to Congress and the public on the implementation of PL 84-99 (33 U.S.C 701(n)), including an evaluation of alternatives available to the Secretary to ensure the USACE is effectively meeting of program goals, and including regular biennial reports under WRDA 2014 Sec. 3029(c) on the specific expenditures and costs, work required, and actions of the Secretary, under PL 84-99.

It appears there are levees which repeatedly fail or are overtopped and are simply get repaired to the same situation time and again, largely with federal taxpayer funding.

Without accurate data and information regarding past emergency actions and the repair and rehabilitation of levees and other flood control works, Congress and the public cannot evaluate the effectiveness of PL 84-99, or the program's contribution to water resource resiliency.

In addition, the Corps initiated a public inquiry Advance Notice of Proposed Rulemaking regarding PL 84-99 in February of 2015 (COE-2015-0004), but the Corps has never since responded to public comments nor completed the Rulemaking exercise. We strongly urge Congress to immediately insist on the Corps' completion of the required reports and insist the Corps to assemble and make publicly available Corps' data and information on expenditures by project and watershed, and identify any instances of **repetitive repair and rehabilitation costs and locations** under PL 84-99.

PL 84-99's treatment of nonstructural options is limited. ER-500-1-1 indicates: Under PL 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 PL 84-99.**

Levee setbacks, in many instances, can be a critical resiliency and sustainability adjustment to improve public safety and environmental management and to 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 PL 84-99 rehabilitation option, but, again, has left this up to local sponsors whether even to consider such an approach. 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. Generally, we would urge establishment of a clear authority for the Secretary or the Chief of Engineers to study the feasibility of making adjustments, and where appropriate, considering nonstructural, use of natural infrastructure, and/or nature-based features as alternatives or additional actions to address levee and flood project rehabilitation. 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 PL 84-99 repairs. This important modification to PL 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.

Amendments Regarding Cost-sharing for Feasibility studies and construction of Natural Infrastructure and Nature-based flood damage reduction projects.

As we have said previously, ASFPM continues to be concerned that despite Congress' efforts in successive WRDA's and Corps program oversight to encourage greater use of non-structural and nature-based approaches in flood damage reduction, we see far too little on-the-ground progress, due to numerous areas of policy bias towards traditional structural approaches. We believe that, given ongoing hydrologic, climate, and development changes in watersheds, a concerted effort is needed to reduce historical biases and to better incentivize the use of these effective risk reduction tools.

In addition to authorizing and directing the Chief of Engineers to regularly apply the Corps' science and engineering data and expertise to consider non-structural and natural infrastructure alternatives in appropriate PL 84-99 repairs and rehabilitations, ASFPM would also recommend the following two amendments regarding cost-sharing rules to better incentivize and support potential for natural infrastructure and nature-based features to be considered as alternatives in Corps development or modification of flood damage reduction projects.

- **Modify cost sharing and guidance to level playing field for natural infrastructure and nature-based features with construction of nonstructural projects compared to structural projects.**

This first amendment would extend the current cap on non-Federal construction costs for nonstructural projects to natural infrastructure alternatives and natural and nature-based features. Present law caps "nonstructural" flood damage reduction and ecosystem restoration projects non-Federal cost shares at 35 percent. However, "natural features" "nature-based features" and "natural infrastructure alternatives" are subject to 50 percent non-federal cost share caps, if the costs of "LERRDS" (lands, interests, rights of way, relocations, and disposal areas) raise a project's costs to above 35 percent, which often may be the case, even though such projects may be less expensive than traditional projects. The amendment brings nature-based, natural features, and natural infrastructure alternatives, which are terms added in recent WRDA's to receive the same 35 percent construction cost-share cap that is now afforded for nonstructural and ecosystem restoration measures, and would provide an entirely appropriate incentive for these generally similar and compatible approaches.

This could be done in 33 USC 2213(b) by adding "and measures employing natural features, nature-based features and natural infrastructure alternatives, as defined in Section 1184 of WRDA 2016 (33 USC 2289a) and Section 1149 of WRDA 2018 (P.L. 115-270)" after "nonstructural flood control measures" where it appears in 33 USC 2213(b), and by adding "and storm and hurricane damage reduction" after "flood control" where it appears in 33 USC 2213(b).

- **Fully fund federal feasibility study cost for nonstructural, natural infrastructure and nature-based features approaches studies to flood damage reduction.**

ASFPM has long supported a requirement that all USACE projects must consider the full range of nonstructural and structural alternatives before the project is implemented. Unfortunately, the current law requires the local sponsor to consent to looking at alternatives. This language should be changed.

The second amendment proposal is intended to provide an alternative to this suggestion, where it would provide the Chief of Engineers discretionary authority to study feasibility of all alternatives at full federal cost for nonstructural, natural infrastructure, and nature-based approaches to flood damage reduction. It would give the Chief of Engineers [or the Secretary] discretion to do feasibility and detailed report studies for flood damage reduction and hurricane and storm damage reduction projects that consider nonstructural, natural infrastructure and nature-based features at full Federal study cost. This would happen where the Chief determines that current or reasonably expected future conditions may warrant such expenditures to provide for appropriate flood or storm damage reduction on a cost-effective or substantial life-cycle federal cost savings basis and/or where nonstructural or natural infrastructure or nature-based features would be considered to provide at least 50 percent of total flood damage reduction benefits in one or more of the final array of considered alternatives. In this instance, due to the full Federal cost, a particular advance consent of a non-Federal sponsor would not be required. This would give the Corps of Engineers the ability to consider such natural infrastructure alternatives where warranted, which often is not done due to refusal of a non-Federal sponsor to request and/or consent to (and pay 50 percent of study costs) the consideration of such measures.

We believe such authority would be responsive to the requests of Corps leaders in the Committee's May Corps oversight hearing for authority to consider broader sets of water resource and hydrologic concerns than they currently can.

Applicability: Where the Chief of Engineers believes potential may exist for nonstructural, natural infrastructure and/or nature-based approaches could result in cost-effective or substantial life-cycle taxpayer savings.

Feasibility Study Cost Share: Communities could receive full federal funding for feasibility studies for flood and storm damage reduction projects that may have potential to utilize nonstructural, natural infrastructure and/or nature-based approaches with potential savings at discretion of the Chief of Engineers.

Study Requirements: One or more of the final array of proposed alternatives evaluated in a covered feasibility study must incorporate nonstructural or natural infrastructure features as a significant component of the project. Feasibility studies carried out under this subsection must incorporate natural infrastructure features that reduce flood or storm damages or flood or storm risks by at least [50 percent] in one or more of the final array of proposed alternatives evaluated.

The feasibility study cost share is seen as a major hurdle for meaningfully assessing natural infrastructure regardless of the relative wealth of a community. Current law and guidance require the Corps to request and receive a non-federal sponsors consent to study nonstructural alternatives, which would not be required when studies are fully paid for at federal expense.

Some lower income communities have been unable to pay the cost shares of such studies and therefore do not receive Corps assistance to look at a full range of options for flood damage reduction. Congress has established an ability to pay provision (33 USC 2213(m)); however, the Corps has not meaningfully implemented that provision and (as best as we can tell) continues to rely on extremely restrictive guidance from 1989, despite having been directed to update that guidance in WRDA 2007.

- **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 require 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 PL 84-99. Other ASPFM recommendations include:

- **Including a provision for expedient buyouts of structures and land under PL 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 PL 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 PL 84-99 assistance (similar to NFIP and Stafford Act repetitive loss mitigation).**

Consideration should be given to reducing federal subsidies in PL 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 Principles, 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. This should be a fundamental principle of planning for community and water infrastructure resiliency. For example, if a levee is designed for a 50-year life, the level of protection it will provide 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 in 2019, and with major Gulf Coast and Eastern Seaboard flooding, from 2017, 2018 and 2019 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 need 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, and we applaud the Committee for considering our nation's water resources infrastructure, especially in light of long-term resiliency concerns. If you have any questions, please contact me, Ricardo Pineda, PE, CFM, Chair, ASFPM at [REDACTED] [REDACTED], or ASFPM Executive Director Chad Berginnis at [REDACTED] [REDACTED].