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TESTIMONY

Water Resources Development Acts: Status of Implementation and Assessing Future Needs

Before the

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By

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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 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) 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 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 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) 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). 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 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. 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 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) 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 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-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 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 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 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 *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. 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 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