



March 30, 2022

U.S. Army Corps of Engineers Vicksburg District
ATTN: Levee Safety Center, Room 221
4155 East Clay Street
Vicksburg, MS 39183

ATTN: Docket ID: COE-2021-0007

Re: Development of the National Levee Safety Program

The American Society of Civil Engineers (ASCE) and the Association of State Dam Safety Officials (ASDSO) are pleased to offer the following comments to the U.S. Army Corps of Engineers (USACE) on phase I of the development of the National Levee Safety Program. The questions addressed in these comments were published in the Federal Register for comment on December 28, 2021, with the comment period closing on March 31, 2022.

Founded in 1852, ASCE is the country's oldest civil engineering organization. Representing more than 150,000 civil engineers from private practice, government, industry, and academia, ASCE is dedicated to the advancement of the science and practice of engineering. ASDSO, founded in 1984, represents more than 3,000 members from all levels of government, dam owners, manufacturers and suppliers, and academia. ASDSO's mission is to improve the safety and condition of the nation's dams, use education to reduce the consequences associated with dam incidents, supporting state dam safety programs, and fostering a unified dam safety community. Our members have a keen understanding of the risks to our nation's levees and the associated flooding risks caused by aging infrastructure and the effects of climate change. ASCE and ASDSO have been actively involved in creating standards and best practices for effective levee management, supporting the creation of safety and mitigation programs at all levels, and supporting the development of modern, resilient infrastructure.

Modern infrastructure must be designed and built to withstand modern risks, and development must account for future risks. Increasingly strong weather events pose significant challenges to the built environment, as well as the natural environment. Programs like the National Levee Safety Program play a critical role in ensuring the safety of the nation's levees, providing the

best and most up to date data on levee systems and communities that sit behind levees, and strengthening levee resilience in the face of climate change.

With nearly two-thirds of Americans living in a county with at least one levee and more than half of the U.S. population living within 50 miles of a coast with continued development in floodplains, levees play a critical safety role. And while most levees within USACE's portfolio are characterized as low risk, a larger portion of the population — about 45% — lives or works behind a high- or very high-risk levee. Unfortunately, 80% of high- or very high-risk levees were found to have one or more levee performance concerns that would likely result in a breach prior to overtopping.

These facts underscore the need to ensure effective implementation of national levee safety guidelines, support for state levee safety programs throughout the nation, and the maintenance of the National Levee Database to ensure the most accurate data is available to the public. ASCE and ASDSO believe that continued focus on resilience, use of modern codes and standards in levee design and construction, and best practices for flood risk management and mitigation should guide the continued implementation of the National Levee Safety Program.

Overall Program Focus and Purpose

1. Do you believe the stated vision/mission/objectives of a national approach will significantly improve levee safety in the Nation in the future? Any suggestions for improvement?

Yes, as stated and used as an implementation guide, the vision/mission/objectives will improve levee safety across the U.S. But only with the buy-in at all levels of government and by levee owners. A national approach is critical to ensuring the safety of levee systems nationwide. It should be the responsibility of the Federal Government to ensure the safety of all federally funded and regulated levees. Federal action should also work hand in hand with state legislation to strengthen levee safety. Government at all levels should focus on implementation of legislation to protect the health and welfare of citizens from levee failure, implementation of mandatory safety inspections and public evacuation plans, and accurate and up-to-date mapping of areas at risk of flooding due to levee breaches.

2. Do you understand the general approach for the development of the program (e.g. stakeholder engagement, key components, etc.)? If not, what is unclear? Any suggestions for improvements?

The general approach has been laid out well. Effective public engagement and solicitation of input is necessary to create the most value for the program. Gaining the perspective from stakeholders such as civil engineers, state and local officials and agencies, and levee owners and operators ensures that a wide variety of expert knowledge goes into the development of safety guidelines. Understanding the requirements and needs of states, communities, and other stakeholders helps to form a basis for effective technical assistance and efficient deployment of resources. One area that remains unclear at this stage is how this national

strategy will encourage and assist states to stand-up new or stronger regulatory (e.g., permitting, inspection, enforcement) programs over non-federal levees.

3. What is the single most important challenge related to levees you think this program should try to help address? Do you see it adequately addressed in this approach?

One of the most important mandates of the National Levee Safety Program is supporting and encouraging the development of levee safety programs at the state level. Oftentimes, state and local governments will not have the resources or experience to effectively provide risk management for locally operated levees. Because many levees were built several decades ago, there may also be a limited knowledge base of how such levees were built.

Supporting the development of state levee safety programs is one of the primary goals of the Integrated Levee Management component of the National Levee Safety Program. However, it remains unclear how the USACE views the roles of state levee safety programs in terms of overall management and oversight of levees. For such programs to be truly effective, they must assume responsibility for ongoing assessment and inspection of levees, rather than acting simply as stewards of federal grant money. In creating state levee safety programs, states often rely on state dam safety programs as a model approach, and the National Dam Safety Program (NDSP) is often cited as a model for the National Levee Safety Program. If this is the model that is to be used, it is significantly important that USACE understands the pros and cons of past NDSP implementation and engages federal and state dam safety officials when implementing elements of the Integrated Levee Management component that focus on supporting state levee safety.

Another critical issue that must be addressed is the use of modern codes and standards in the design and construction process of the nation's levees. For example, the Federal Emergency Management Agency's (FEMA) *National Flood Insurance Program Floodplain Management Requirements* provide an effective tool to inform local officials as they implement local floodplain management ordinances, and also support a broader understanding of floodplain management strategies.¹ Many of the nation's levees were built several decades ago and did not utilize codes and standards as rigorous as those that exist today. This poses significant challenges to the nation's levees which are greatly affected by rising water levels and increased precipitation which were not accounted for when many of the nation's levees were originally built. Ensuring the use of current codes and standards can enhance the effectiveness of levee systems, mitigate flood risk, and protect communities that sit behind levees.

¹ FEMA 480, *National Flood Insurance Program (NFIP) Floodplain Management Requirements*, February 2005, https://www.fema.gov/sites/default/files/documents/fema-480_floodplain-management-study-guide_local-officials.pdf.

National Levee Safety Guidelines

1. Which topics do you think you will find the most useful? Why?

A topic of critical importance is that of designing new levees. Civil engineers rely on the most up-to-date data, as well as the use of codes and standards when designing infrastructure that is built to last and built to withstand the elements. However, the average age of the nation's levees is 50 years old, and many levees were built using standards and codes which are much less rigorous than those that are utilized today. This challenge is amplified by the fact that there is not currently a national standard or requirement for levee design, construction, or operation and maintenance.²

Increasingly severe weather events which bring heavier levels of precipitation demand modern codes and standards be utilized in the levee design process, and their use should be listed among best practices for levee owners and operators. Guidelines should incorporate these measures into any discussion of new levee design. This is of particular importance as the effects of climate change constantly create new challenges and hazards which can have significant impact on communities with increased flood risk.

Additionally, flood risk communication and floodplain land use are important topics to be addressed. Development in flood prone areas continues to increase as people are attracted to historically fertile floodplains and coastal areas, and lower land costs. Levees often provide a false sense of security for people living and working behind them. The guidelines should provide a framework to increase the public's flood risk understanding and encourage regulations that limit floodplain land use.³

2. Are there any missing topics that you think should be included?

Levee resilience should be a critical topic of discussion in developing the National Levee Safety Program. Climate change and its effects continue to reduce the overall effectiveness of levees and increase flood risk. Levee resilience measures should be incorporated into every phase of levee development. This includes the development of performance criteria, national standards to address interdependencies, establishment of minimum performance goals, and a comprehensive all-hazard risk assessment.⁴

3. Are there any areas of content where templates, specific methodologies, tools, or other aids would be particularly helpful to you?

A Model State Levee Safety guideline is most likely on the list already. From a state perspective, this should be a primary tool to be developed.

² American Society of Civil Engineers, *2021 Report Card for America's Infrastructure*, <https://infrastructurereportcard.org/wp-content/uploads/2017/01/Levees-2021.pdf>

³ American Society of Civil Engineers Policy Statement 421, *Floodplain Management*, <https://www.asce.org/advocacy/policy-statements/ps421---floodplain-management>

⁴ American Society of Civil Engineers Policy Statement 500, *Resilient Infrastructure Initiatives*, <https://www.asce.org/advocacy/policy-statements/ps500---resilient-infrastructure-initiatives>

Standard templates for inspection reports, operations & management (O&M) manuals, and emergency action plans would also be useful. Such templates should have a very simple format with the end user in mind.

Finally, the guidelines should address the need for levee owners to maintain a well-organized records management system. Important records should include design reports, plans and specifications, construction records, major modifications, as-built drawings, O&M manuals, inspection reports, performance during flood events, potential failure mode analyses, and risk assessment summaries. These types of documents are required to fully understand levee history and assess future performance.

Integrated Levee Management

1. Is clarifying the roles and responsibilities for levee related activities at the federal, tribal, state, levee owner, and community levels the right place to start or are we missing anyone?

Engaging with officials and levee owners and operators at these levels is an appropriate starting point. This provides an opportunity to gather data, gauge state, local, and tribal needs, and provide the national program with a sense of what tools need to be provided to support effective state programs. This will aid in prioritizing and deployment of federal resources to areas of greatest need.

2. What is the biggest value of standing up state levee safety programs?

The biggest value of standing up state levee safety programs is providing for day-to-day management and oversight of levees by those who would presumably have institutional knowledge of a state's levee systems. This allows for more efficient management of levees, which includes levee monitoring and inspection activity, risk assessment, as well as streamlined management of funding provided by a wide range of sources. Well managed state levee safety programs would also be able to coordinate best practices among a wide variety of stakeholders including levee owners and operators, civil engineers, and environmental and emergency management agencies.

3. What do you think would be the most important activities for state levee safety programs?

Strong, well-funded, and well managed state levee safety programs would be able to provide a range of necessary services. Chief among them would be continuous oversight of levees, including regular monitoring and inspection. State levee safety programs would be able to ensure that safety guidelines produced at the national level are followed, ensure the design and construction of new levees utilizes modern codes and standards, and coordinate effective public engagement in communities that sit behind levees ensuring citizens are knowledgeable of current risks.

4. Other than funding, what are the biggest barriers states might have in standing up levee safety programs?

States may encounter challenges in standing up and implementing effective state levee safety programs. As previously mentioned, many levees throughout the country were built several decades ago. Because of this, there may be limited local knowledge of issues specific to certain levees. For instance, there may be uncertainty about what types of materials were used during a levee's construction decades prior, which would require expensive and rigorous inspection to determine.⁵

In addition, please note that in some states implementation of state levee safety programs could face bureaucratic challenges. Often programs such as this end up folded into larger environmental management or water resources agencies. Integrating programs into such agencies would require adoption of agency regulations—often a slow process--, may require that implementing a program's overall mission and scope, and could be subject to multiple levels of agency approval.

5. For the states/tribes/regional district grants, the legislation reserves 25 percent be used to identify and assess non-Federal levees, but what other priorities or activities should the remaining 75 percent of grant funding go towards?

Remaining funds should be used to support day to day and long-term functions of state programs. Support for monitoring and inspection of levees is the most important function of a program, therefore a considerable amount of resources should be dedicated to improving a state's capacity to conduct these activities. Grant funds should also be used to support levee rehabilitation efforts, program staffing needs, staff training, and education and engagement of communities about levee safety and associated risks of living behind levees.

6. Are there any federal programs that are hampering your ability or providing a disincentive to adequately perform flood risk or levee management activities? If so, please explain.

At this stage, there are not any federal programs which we view as hampering the ability of states and communities to adequately perform flood risk or levee management activities.

7. Where do you see opportunities for federal programs to be adjusted/realigned/reprioritized to better support flood risk management/levee safety in communities with levees?

⁵ Ibid., American Society of Civil Engineers, *2021 Report Card for America's Infrastructure*, <https://infrastructurereportcard.org/wp-content/uploads/2017/01/Levees-2021.pdf>

In all cases, there should be a consistent definition of flood risk in place, as well as an accepted framework for how risk should be estimated.⁶ These should emphasize risk prevention, mitigation, response and recovery, and should be geared toward protecting the health and safety of communities and preserving the value of floodplains. In addition to being implemented across relevant federal programs, these priorities should be incorporated into all levee safety and management programs at all levels.

National Levee Database and Data Collection

- 1. What are the most important decisions you need to make to improve flood risk management decisions in your community or on your levee? What data do you most need to support these decisions?**

N/A

- 2. How might USACE encourage participation of levee owners or states in either providing levee information or participating in USACE-led levee inspections and risk assessments?**

Public outreach and education are critical in this effort. Educating stakeholders and communities about the benefits of programs such as this can highlight a community's infrastructure needs, encourage better risk management practices, and shed light on federal resources that may be available. On this last point, provision of federal resources is essential to support effective levee management, flood mitigation, and infrastructure improvements. What is just as important is ensuring states and communities know what funds are available and how they can obtain or become eligible to receive such funds.

Years ago, when the National Inventory of Dams (NID) was getting started, USACE provided stipends to the state dam safety programs in exchange for data. This may be a way to jump-start the initial effort to get non-federal levee data into the NLD. Now, states have an incentive to provide updated data to the NID because that data is tied to how much funding they receive in the form of State Assistance Grants through the NDSP annually.

- 3. What types of levee information is most meaningful to people who live and work behind levees? What role can/should the National Levee Database play in providing this information?**

Knowledge of risks associated with levees can be an invaluable tool to communities that live and work behind levees. Flood risk to communities, even those not in high flood risk areas, can be greatly exacerbated by increasingly severe weather events and increased levels of precipitation brought on by climate change.⁷ As these conditions continue to grow in strength with each passing year, increased strain is placed on the nation's levees, increasing

⁶ American Society of Civil Engineers Policy Statement 545, *Flood Risk Management*, <https://www.asce.org/advocacy/policy-statements/ps545---flood-risk-management>

⁷ *Ibid.*, 2021 Report Card for America's Infrastructure.

the chances of a breach. A clear assessment of levee risk can inform communities' efforts to implement evacuation plans and determine flood insurance needs, and can be factored into commercial development plans. The National Levee Database currently provides information and analysis about various levees and communities throughout the country, including population, total property value, and in some cases levee risk assessments. Efforts should be made to complete these analyses, continue to develop an effective risk assessment tool, and provide states and communities with continual education and information about increased risk to levees.