

Flood Risk Management Priorities

Over just a few weeks, Hurricanes Harvey, Irma, and Maria led to nearly 200 deaths and caused an unprecedented level of devastation, including damage and destruction to many communities' and their critical infrastructure systems. Estimates for these storms' damages reach into the hundreds of billions of dollars and it will likely take years to rebuild. Unfortunately, this is not the first time, nor will it be the last, that we have encountered the devastating impacts of storms and flooding. According to NOAA's National Centers for Environmental Information, the nation has suffered 212 weather and climate disasters since 1980 with damages totaling \$1.2 trillion and the tragic loss of lives.

Two of the greatest challenges facing the nation are recognizing the magnitude of risk posed by flooding and motivating the public and decision-makers to make the investments and difficult policy decisions required to reduce flood risk. In the wake of Hurricanes Harvey, Irma, and Maria, the time is ripe to move aggressively forward to address the challenges of flood risk management.

In 2014, the frequency of recent flood disasters led the ASCE's Task Committee on Flood Safety Policies and Practices (TCFSP) to visit communities, reach out to governmental and nongovernmental organizations nationwide, host a flood risk summit, and carefully examine lessons learned in post-Katrina floods, including those resulting from Hurricane Sandy. These efforts resulted in a report entitled "Flood Risk Management: Call for a National Strategy" that identifies specific actions that can and should be implemented to reduce the nation's exposure and vulnerability to the consequences of floods and hurricanes.

ASCE recommends implementing the following flood risk management measures to better prepare the nation for increased risk.

1. DEFINE THE PROBLEM

- **Establish a common definition of flood risk, a consistent means of assessing risk, and an accepted framework for how risk should be estimated for different scales and purposes.**
- The various ways of assessing risk need to be consistent, practical, and transparent. The tools for risk assessment should be such that they can be readily implemented by practicing engineers and understood by the public.

2. INFORM ALL STAKEHOLDERS OF FLOOD RISK

- **Implement effective collaboration, clear communications, and well-defined roles, responsibilities, and authorities of all levels of government, the private sector,**



nongovernmental organizations, and the public. Those affected by floods must understand and have the tools to manage their personal, household, and community risks.

- Identify governance structures that provides local governments with federal and state support and guidance in the execution of flood risk management strategies brings together problems and solutions. Risk communication aimed at raising public awareness is most effective when it is delivered at the local level by local leaders.

3. **BALANCE STRUCTURAL AND NONSTRUCTURAL MEASURES**

- **Use a balance of structural and nonstructural measures to foster sustainable infrastructure and resilient communities. This balance includes using natural defenses to reduce risk while preserving, restoring, and enhancing ecosystems.**
- Balanced measures include the use of floodplains, floodways, and natural ecosystems for rerouting and storing floodwaters, consider the impact of natural marshes and wetlands on storm surge and waves, and use beaches and dune systems to reduce the impact of surge and waves. Restoring ecosystems has broad benefits for society, reducing risk by reducing hazard (likelihood of flooding) and reducing risk by limiting the people and assets exposed to flooding. Ecosystems can also provide a significant source of resilience for structural measures by working in concert with them to provide enhanced capacity to deal with uncertainties and unexpected events.

4. **REVIEW LAND USE DECISIONS**

- **Base land use decisions on flood risk management principles that reflect community values, priorities, heritage, and equity.**
- Land-use decisions should consider, and better yet reduce, the risks and impact of flooding and should include all stakeholders in integrated discussions of appropriate, flood-compatible land uses. These discussions require coordination and planning within watersheds to be effective and to ensure that flood risks are not shifted from one community to another unfairly.

5. **FUND FEDERAL, STATE AND LOCAL PROGRAMS TO ADDRESS RISK**

- **Establish long-term, reliable funding mechanisms for flood risk reduction measures at the federal, state, and local level.**
- Effective flood risk management requires continuous and adequate funding of both structural and nonstructural approaches to reduce the growing flood risk to the nation. Addressing deficiencies in aging infrastructure and ensuring that the infrastructure can adapt to climate change and population growth will require significant resource commitments and close attention to innovative alternatives to structural approaches.
- According to the National Institute of Building Sciences, every dollar spent on pre-disaster mitigation and preparedness saves \$4 in rebuilding costs after a storm.
- **We urge Congress to fully fund these critical flood risk mitigation programs:**
 - the National Flood Insurance Program (NFIP) Hazard Flood Mapping program is essential to identification of baseline national flood exposure and is funded at less than half its needs. Furthermore, President Trump's FY18 budget requested a \$190 million cut to this program;
 - the High Hazard Potential Dam Rehabilitation Program provides grants to states and local communities to rehabilitate, repair, or remove the nation's non-federal, high hazard potential dams before they fail. Though recently authorized in the Water Infrastructure Investments for the Nation (WIIN) Act for \$10 million in both FY17 and FY18, it has yet to receive any appropriations;
 - the National Dam Safety Program provides grants to state dam safety agencies for training dam safety engineers, research, and for the creation of a National Inventory of Dams. For decades, the program has been funded below its authorized level of \$13.9 million per year; and

- the National Levee Safety Initiative, passed in the 2014 Water Resources Reform and Development Act (WRRDA), promotes consistent safety standards, creates levee safety guidelines, and provides grants to states to establish participating levee safety programs. This program has yet to receive any of its authorized \$79 million per year.

6. **ADAPT FLOOD RISK MANAGEMENT STRATEGIES TO MEET CHANGING CONDITIONS**

- Severe weather events and stronger storms pose flooding threats by increasing the frequency, severity, and duration of flood events. With every storm event, maps that had once depicted areas as being relatively free of flooding may now show that communities and infrastructure are now vulnerable to flooding. Flood maps must be regularly updated to communicate the most accurate information available. Plans to develop low-lying areas or to rebuild them after a flood event should be based on a full understanding of the consequences of flood damage, including loss of life, and should consider the long-term costs of recovery, as well as those costs that will be incurred in adapting over time. This can be accomplished under some circumstances by measures such as elevating the structures to account for rising sea levels and hydrologic uncertainty, as well as making full use of a wide range of mitigation measures, including property acquisition and relocation of people, dry- and wet-flood proofing, citizen education, early warning systems, improved building codes, and risk transfer through insurance.
- The Federal Flood Risk Management Standard (FFRMS), which was repealed by President Trump in August 2017, took a fiscally responsible, common sense approach of considering and mitigating flood disaster risks for federally funded development in flood prone areas that we believe should be part of any sustainable agency and organizational planning. The FFRMS provided a suite of flood risk mitigation options, including using data and methods informed by best available, actionable climate science or elevating at-risk structures above future predicted flood levels or levels that include a reasonable margin of safety. We urge Congress and the current Administration to establish similar federal flood risk management standards.