

Levees cannot fully eliminate risk of flooding to New Orleans

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Levees and floodwalls surrounding New Orleans -- no matter how large or sturdy -- cannot provide absolute protection against overtopping or failure in extreme events, says a new report by the National Academy of Engineering and the National Research Council. The voluntary relocation of people and neighborhoods from areas that are vulnerable to flooding should be considered as a viable public policy option, the report says. If relocation is not feasible, an alternative would be to elevate the first floor of buildings to at least the 100-year flood level.

The report is the fifth and final one to provide recommendations to the Interagency Performance Evaluation Task Force (IPET), formed by the U.S. Army Corps of Engineers to examine why New Orleans' hurricane-protection system failed during [Hurricane Katrina](#) and how it can be strengthened. The previous four reports by the NAE and Research Council examined various draft volumes of the IPET. This report reviews the 7,500-page IPET draft final report, reflects upon the lessons learned from Katrina, and offers advice for how to improve the hurricane-protection system in the New Orleans area.

Although some of the report's recommendations to enhance hurricane preparedness have been widely acknowledged for years, many have not been adequately implemented, said the committee that wrote the report. For instance, levees and floodwalls should be viewed as a way to reduce risks from hurricanes and storm surges, not as measures that completely eliminate risk. As with any structure built to protect against flooding, the New Orleans hurricane-protection system promoted a false sense of

security that areas behind the structures were absolutely safe for habitation and development, the report says. Unfortunately, there are substantial risks that never were adequately communicated to the public and undue optimism that the 350-mile structure network could provide reliable flood protection, the committee noted.

Comprehensive flood planning and risk management should be based on a combination of structural and nonstructural measures, including the option of voluntary relocations, floodproofing and elevation of structures, and evacuation, the committee urged. Rebuilding the New Orleans area and its hurricane-protection system to its pre-Katrina state would leave the city and its inhabitants vulnerable to similar disasters. Instead, settlement in areas most vulnerable to flooding should be discouraged, and some consideration should be given to new designs of the New Orleans metro hurricane-protection system. As part of the future design, relocation of some structures and residents would help improve public safety and reduce flood damages.

For structures in hazardous areas and residents who do not relocate, the committee recommended major floodproofing measures -- such as elevating the first floor of buildings to at least the 100-year flood level and strengthening electric power, water, gas, and telecommunication supplies. Also, a comprehensive evacuation program should be established that includes well-designed and tested evacuation plans; improved local and regional shelters that would make evacuations less imposing; and long-term strategies that could enhance the efficiency of evacuations, such as locating facilities for the ill and elderly away from hazardous areas.

Furthermore, the 100-year flood level -- which is a crucial flood insurance standard -- is inadequate for flood protection structures in heavily populated areas such as New Orleans, where the failure of the system would be catastrophic. Use of this standard in the New Orleans

area has escalated the costs of protection, encouraged settlement in areas behind levees, and resulted in losses of life and vast federal expenditures following numerous flood and hurricane disasters, the committee said.

Regarding IPET's draft final report, the committee concluded that it contained important advances in characterizing and understanding the nature of Gulf hurricane storm surges and waves -- in particular explaining the storm surge generated by Hurricane Katrina, how waters from the surge entered the New Orleans metro region, and the amount of flooding across the city. In addition, IPET's studies have made significant contributions to simulating hurricane impacts, characterizing the collective effects of hurricane damage, and improving knowledge of regional vulnerability to hurricanes and storm surge.

However, the final IPET report should provide a better explanation of its methods to evaluate [flood](#) risks, the committee said. The final report also should be written in a more clear and organized manner, using layman's terminology that can be understood by the public and officials. Such clarity is lacking in Volume VIII, which was the principal focus of the final two years of IPET's study. This volume assesses the risks posed by future tropical storms and contains inundation maps that show the areas at most risk for future flooding. These maps are important to citizens, businesses, and government agencies for planning resettlement and redevelopment in the region, but the volume contains limited discussion of the implications of these maps. Moreover, at times the extensive technical information presented in the volume overshadows key results.

The committee also recommended that a professional technical firm prepare a second document for the public and officials that would be shorter and focus on explaining IPET report results and implications for reconstruction and resettlement.

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