

# Civil engineers' report on US flood preparedness: Lessons of Katrina and Sandy ignored

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6 September 2017

The catastrophic flooding of Hurricane Harvey in Houston is occasion to revisit the analysis and recommendations prepared by the American Society of Civil Engineers in the aftermath of Hurricane Katrina in 2005. A damning 2007 report, *The New Orleans Hurricane Protection System: What Went Wrong and Why*, documented decades of neglect, underfunding, and policy failures. A 2014 follow-up, *Flood Risk Management: Call for a National Strategy*, showed nearly complete neglect of the recommendations.

Both documents are remarkable in the strength of the language used, well beyond the ordinary, expressing the clear frustrations of the authors at the disconnect between decades of political neglect and micromanagement of sound engineering practices, and the gulf between what was continually promised by government and what was delivered. The portrait that emerges is of a system in complete chaos, with dozens of local and federal agencies struggling even to maintain levees and pumping stations, some well over a century old, with no funding or centralized leadership to make progress.

The 2007 report was quite blunt: “what is unique about the devastation that befell the New Orleans Area from Hurricane Katrina—compared to other natural disasters—is that much of the destruction was the result of engineering and engineering-related policy failures.” Again and again, the report documented the cutting of safety margins, the failure to critically revisit decades-old flood engineering in light of updated science, complete lack of coordinated planning or a coordinated systems analysis of critical risks in such a system, and even lack of such basic information as updated maps of the heights at which components of

the system would be overtopped in a storm.

The ASCE report concluded, “The southeast Louisiana hurricane protection system was planned, designed, and constructed over four decades without a system-wide approach or integration with land use, emergency evacuation, or recovery plans. ... The hurricane protection system, however, is a system in name only. In reality, it is a disjointed agglomeration of many individual projects that were conceived and constructed in a piecemeal fashion. ... The management of the hurricane protection system is chaotic and dysfunctional.”

During Katrina, this resulted in a perfect storm of engineering and operational failures, leading to over 50 distinct breaches in New Orleans' floodwalls. As the storm approached shore, pumping stations had to be evacuated by their operators, rendering them useless. Multiple gates in the flood control system could not be closed because of ongoing maintenance or neglect.

The ASCE noted that “very few, if any” of New Orleans' hurricane protection system projects had been externally reviewed. “As a result, questionable engineering decisions were made for the New Orleans hurricane protection system ... The pressure for trade-offs and low-cost solutions likely compromised quality, safety, and reliability.”

Katrina did not emerge as an unforeseeable event of nature. The levees of New Orleans had been breached by Hurricane Betsy in 1965, precipitating plans by the Army Corps of Engineers to provide more comprehensive flood protection measures. The timeframe for completion of these was the year 2015! In 1969, one of the strongest Atlantic hurricanes on record, Camille, would come ashore at Category 5

strength, the highest, and devastate the Mississippi shore only 60 miles east of New Orleans. Katrina, by comparison, hit at only Category 3 strength.

More from the ASCE: “Protecting against life-threatening risk was put on the back burner of public priority. Perhaps no one truly realized how catastrophic levee failures would be. Perhaps no one was willing to pay the price necessary to build a reasonably safe levee system. Perhaps the levee boards became distracted by development projects, airports, parks, casinos or other matters that were given priority above the primary task of caring for the levees.”

The report concluded with a 10-point call to action, noting that “the nation is now at a unique juncture where past mistakes in the hurricane protection system for New Orleans can be learned from and rectified.”

The response to the ASCE recommendations can be gleaned from the title to the preamble of their 2014 follow-up: “[Hello?] Is No One Listening?”

Dozens of leading engineers participated, visiting many potentially affected communities, reviewing governmental and non-governmental actions and policies, and organizing a national flood risk summit.

The tone of their report showed incredulity and resignation. By 2014, the catastrophe of Katrina had been followed by that of Hurricane Ike in 2008, the Midwest floods of 2011, and Superstorm Sandy in 2012. Congress had authorized in 2007 a National Flood Vulnerability Assessment, and then failed to fund it.

The report declared: “Proposals to deal with this challenge have languished in multiple congressional committees. The Unified National Program for Floodplain Management, called for by Congress, was last revised in 1994 and its recommendations lie dormant.” The ASCE further notes “climate change and population growth will further stress this already difficult situation,” and, “If something is not done to reduce risk, we are passing on to succeeding generations a potentially insurmountable challenge.”

The engineering group’s conclusion: “A failure to act today will have enormous future consequences. The call for action must once again be sounded.”

The 2013 ASCE “report card” for American infrastructure graded the condition of its levees as “D-” and its dams as “D.” The cost to upgrade these facilities, \$50 billion apiece. This year’s “Dam

Rehabilitation and Repair Act” will direct some \$80 million a year toward dam repair: at that rate, the existing deficiencies in dams would be rectified in six centuries. Levee repair, later estimated as an \$80 billion cost, has not had a single dollar appropriated.

The ASCE warned, “We are at an inflection point with respect to flood risk.” Unusually for a policy document, it observed that land-use and flood control “practices have effectively privatized benefits and socialized losses. Until our national approach to this issue changes the spiral of losses will continue.”

Any serious analysis must conclude that the unfolding catastrophe in Houston will change nothing, so long as the capitalist economic and political structure remains unchanged.

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