The Day the Dike Breaks

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Texas Community Watershed Partners
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Harvey Estimated Maximum Riverine Inundation

Riverine flooding along gaged channels only. Does not include all HCFCD channels. Does not include information of flooding from other sources.

Survey
Moral Hazard
lack of incentive to guard against risk where one is protected from its consequences, e.g. by insurance.

Induced Development
Improved Methods for Estimating Flood Depth Exceedances Within Storm Surge Protection Systems

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Abstract

Contemporary studies conducted by the U.S. Army Corps of Engineers estimate probability distributions of flooding on the interior of ring levee systems by estimating surge exceedances at points along levee system boundaries, calculating overtopping volumes generated by this surface, then passing the resulting volumes of water through a drainage model to calculate interior flood depths. This approach may not accurately represent the exceedance probability of flood depths within the system interior; a storm producing 100-year surge at one point is unlikely to simultaneously produce 100-year surge levels everywhere around the system exterior. A conceptually preferred approach estimates surge and waves associated with a large set of storms. Each storm is run through the interior model separately, and the resulting flood depths are weighted by a parameterized likelihood of each synthetic storm. This results in an empirical distribution of flood depths accounting for geospatial variation in any individual storm’s characteristics. This method can also better account for the probability of levee breaches or other system failures. The two methods can produce different estimates of flood depth exceedances and damage when applied to storm surge flooding in coastal Louisiana. Even differences in flood depth exceedances of less than 0.2 m can still produce large differences in projected damage. This article identifies and discusses differences in estimated flood depths and damage produced by each method within multiple Louisiana protection systems. The novel coupled dynamics approach represents a step toward enabling risk-based design standards.
Fragility and Resilience Indicators for Portfolio of Oil Storage Tanks Subjected to Hurricanes

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Abstract

This paper develops fragility functions and estimates of resilience indicators for aboveground storage tanks (ASTs) subjected to hurricanes, which can be efficiently applied to all the tanks in a regional portfolio of ASTs to assess their hurricane performance. Fragility and resilience assessment of a portfolio of ASTs is essential for planning mitigation strategies at the regional level and at the level of individual structures. Recently, studies have started assessing the fragility of ASTs under hurricane loads; most of the existing studies are focused on a specific AST type and a specific hurricane-related hazard. However, in order to facilitate performance assessment of an entire portfolio of ASTs, fragility functions for different types of tanks and hazards are necessary, which are lacking in the literature. Furthermore, estimates for resilience indicators such as repair costs and downtime are also not available in the literature. Therefore, to address these gaps, empirical fragility data of ASTs subjected to hurricanes and oil tankers, several hundreds of feet above a coastal plain between Houston and Galveston will be used in this study. The vehicles carry the chemicals and oil for your car, your clothes, your hair gel and your underwear, your kid's soccer ball and your mother's hospital IV. And the entire system is sitting in the path of some future hurricane.
Structural versus Non-structural