



Hazard Reduction & Recovery Center

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“Identifying the Impact of the Built Environment on Flood Damage in Texas.”

By Brody, Zahran, Highfield, Grover, & Vedlitz. 2008

Greater amounts of people living in coastal areas means greater amounts of watertight surfaces like pavement and buildings, changing of hydrological systems, and an overall weakened ability for these systems to naturally hold and store surface water run-off. Because of this, communities, households and private property are increasingly vulnerable to damage from repetitive floods. No study to date has fully tested the impact of the human built environment based on multiple flood events over time, over large geographical areas, and controlling for biophysical and socio-economic characteristics.

Findings

This study examines the relationship between the built environment and flood impacts in Texas, which always gets the most damage from flooding of any other state in the country. The study provides evidence that flood damage is not only because of rainfall, but also is driven by the different kinds of human development. Data shows that the timing of precipitation is particularly important in terms of its effect on the amount of property loss. Heavy precipitation the day before the actual flood event is by far the strongest predictor of total property damage. Property damage is mostly influenced by where within an ecological system development unfolds rather than how much is built. The disruption of natural wetlands is the most important built environment indicator of flood damage. Altering or removing a wetland to make car parks, roads and rooftops, for instance, takes away its ability to capture, hold and store water run-off.

Implications

Despite the widespread policy and engineering measures to reduce the impacts of floods, they remain one of the greatest threats among all natural hazards to the property and safety of human communities in the United States. This study offers some important insights into the relationship between the human built environment and flood damage. Development decisions based on location become critical in lessening property damage from floods in the future. Disrupting the natural hydrological system can worsen flooding or create flood problems in areas that weren't considered vulnerable before. Developments initially believed to be safe from flood threats become an unexpected target of expensive flood damage over time.