



Recovery after Hurricane Ike in Winnie, TX. Retrieved from www.fema.gov, Mike Moore

## Building Community Resiliency

### Spatial Links between Household and Business Post-disaster Recovery

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In 2008, Hurricane Ike wreaked havoc on the small island community of Galveston, TX. Five years have passed since Ike made landfall and with an ever declining population, the community has still not fully recovered. Researchers wondered if the return of businesses and households were spatially linked, investigating recovery following Ike. They thought that the return of either households or businesses would affect the return of the other. They found that household and business recovery is indeed interdependent.

Researchers decided to control for the following to be sure they were not the determining factors in the ability to recover:

- the extent of damage
- neighborhood characteristics
- business characteristics

### Household and business recovery is linked

Neighborhood characteristics include median household income, percentage of the population over 65 years, and the average household size. Business characteristics include the total employment size, and whether they were a franchise or not.

They found that households and businesses have a symbiotic relationship and that the return of one was dependent on the return of the other. The higher the percentage of businesses re-opening in the vicinity of a household, the more likely it is that the household will be occupied. Businesses had the greatest spatial influence on whether or not households were returning, influencing as far as 2.41 km. Households also influenced business recovery, but only at a distance of 0.8 km. Households located near vulnerable businesses are more vulnerable than other households and vice versa.

They also found that higher-income neighborhoods

housing dislocation

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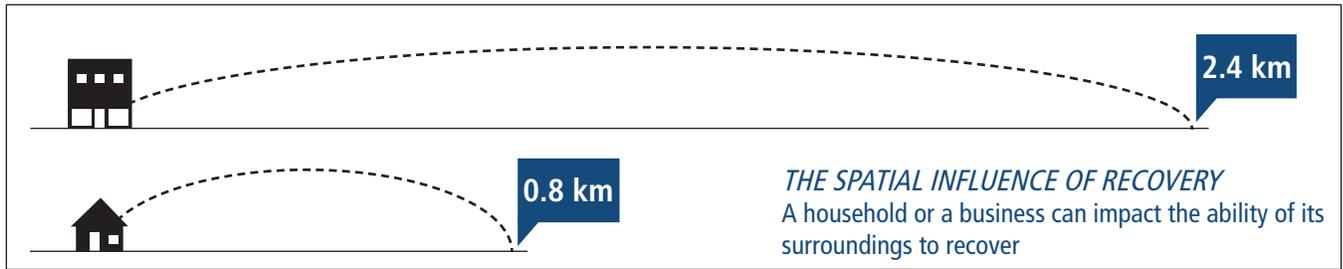
RECOVERY OUTCOME

business interruption

*Recovery is dependent upon households and businesses*



*The complex and interconnected relationship of households and businesses*



were actually less likely to return home, contradictory to current research. This may be the case, because low-income households were returning, but returning and living in damaged and unrepaired homes. Low-income households tend to rely on low-paying service industry jobs and may not have the financial resources to be away from homes or jobs for extended periods of time. On the other hand the percentage of elderly populations and the household size did not influence the return of households to the island.

Businesses were mainly influenced by whether or not they were a franchise. In fact, franchise businesses were about 8-10 times more likely to open up their doors 3 months after the storm. This demonstrates the importance of vertical linkages in recovery and the depth and breadth of financial resources among franchise businesses. Interestingly, the number of employees in a business was not a factor in the ability to return. This may be, in large part, because only 2% of surveyed businesses were considered large, having greater than 50 employees.

There are several recommendations based on these findings. Firstly, it is important to take a complex system approach to understanding community resilience. Public and private sectors and households are a finely integrated system. Our study shows that households and businesses are bonded closely in post-disaster return: enhancing the resilience of one will help the recovery of the other. The study helps us understand community resilience and to design appropriate disaster management policies and programs. Secondly, businesses should play a more active role in disaster management. This means implementing hazard mitigation and disaster preparedness strategies and techniques. Businesses should not only invest in their own protection, but should foster overall community resilience. Lastly, policies and programs should incorporate disaster relief to businesses as a means of speeding recovery and improving resilience of the entire community.

Overall, this study is significant, because it is the first effort to link household and business return spatially. Disasters have a tendency to magnify existing relationships in urban areas and by studying disasters we can truly understand the larger urban forces at play. Community recovery depends on the recovery of both households and businesses, and so, community resiliency should be the resiliency of both households and businesses.

## METHODS

To assess the strength, direction, and decay of this spatial relationship between households and businesses, researchers geocoded data from 980 household and 145 business surveys, which were collected between 2 and 6 months after the storm. In particular, they evaluated the return of households and businesses 3 months after Hurricane Ike.

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