MAPPING SOCIAL VULNERABILITY TO ENHANCE HOUSING AND NEIGHBORHOOD RESILIENCE

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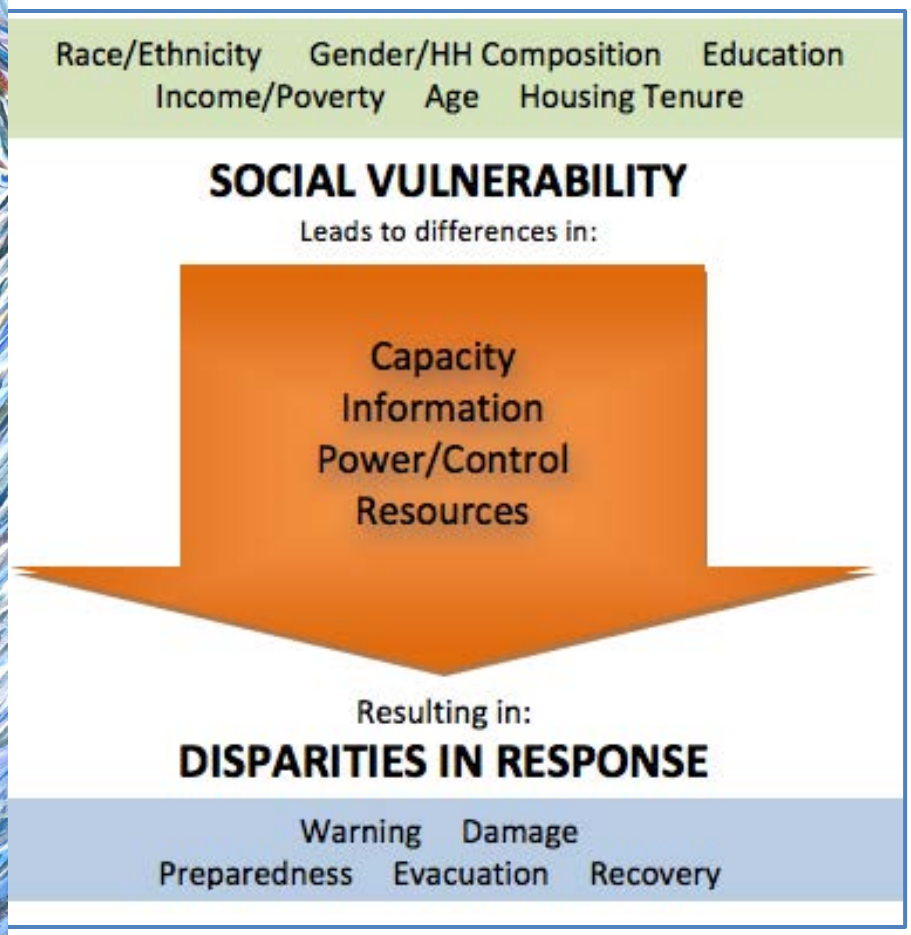
Social Vulnerability (SV) and the logic of SV Mapping



- Focus is on social factors and processes that generate vulnerability in terms of a person's or group's capacity to anticipate, cope with, resist and recover from the impact of a natural hazard
- Social vulnerability will rarely be uniformly distributed among the individuals, groups, or various populations comprising social systems

Levels of Social Vulnerability Analysis

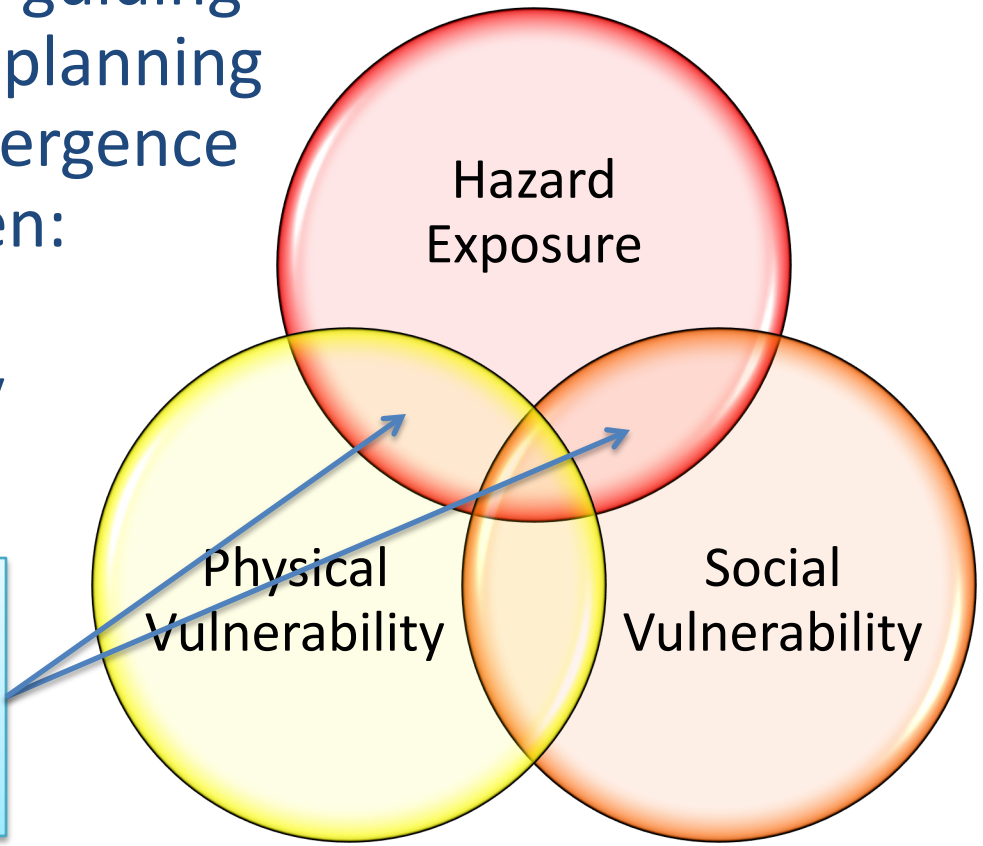
Base Social Vulnerability Indicators (percentages)	2nd Order	3rd Order
1. Single parent households with children/Total Households 2. Population 5 or below/Total Population	Child care Needs	Socially Vulnerable Hotspot
3. Population 65 or above/Total Population 4. Population 65 or above & below poverty/Pop. 65 or above	Elder Care Needs	
5. Workers using public transportation/Civilian pop. 16+ and employed 6. Occupied housing units without a vehicle/Occupied housing units (HUs)	Transportation needs	
7. Occupied Housing units/Total housing units 8. Persons in renter occupied housing units/Total occupied housing units 9. Non-white population/Total population 10. Population in group quarters/Total population 11. Housing units built 20 years ago/Total housing Units 12. Mobile Homes/Total housing units 13. Persons in poverty/Total population	Temporary Shelter and housing recovery needs	
14. Occupied housing units without a telephone/Total occupied HU 15. Population above 25 with less than high school/Total pop above 25 16. Population 16+ in labor force and unemployed/Pop in Labor force 16+ 17. Population above 5 that speak English not well or not at all/Pop > 5	Civic Capacity needs	

The entire set can be combined to capture hyper-vulnerability, or identify hotspots.

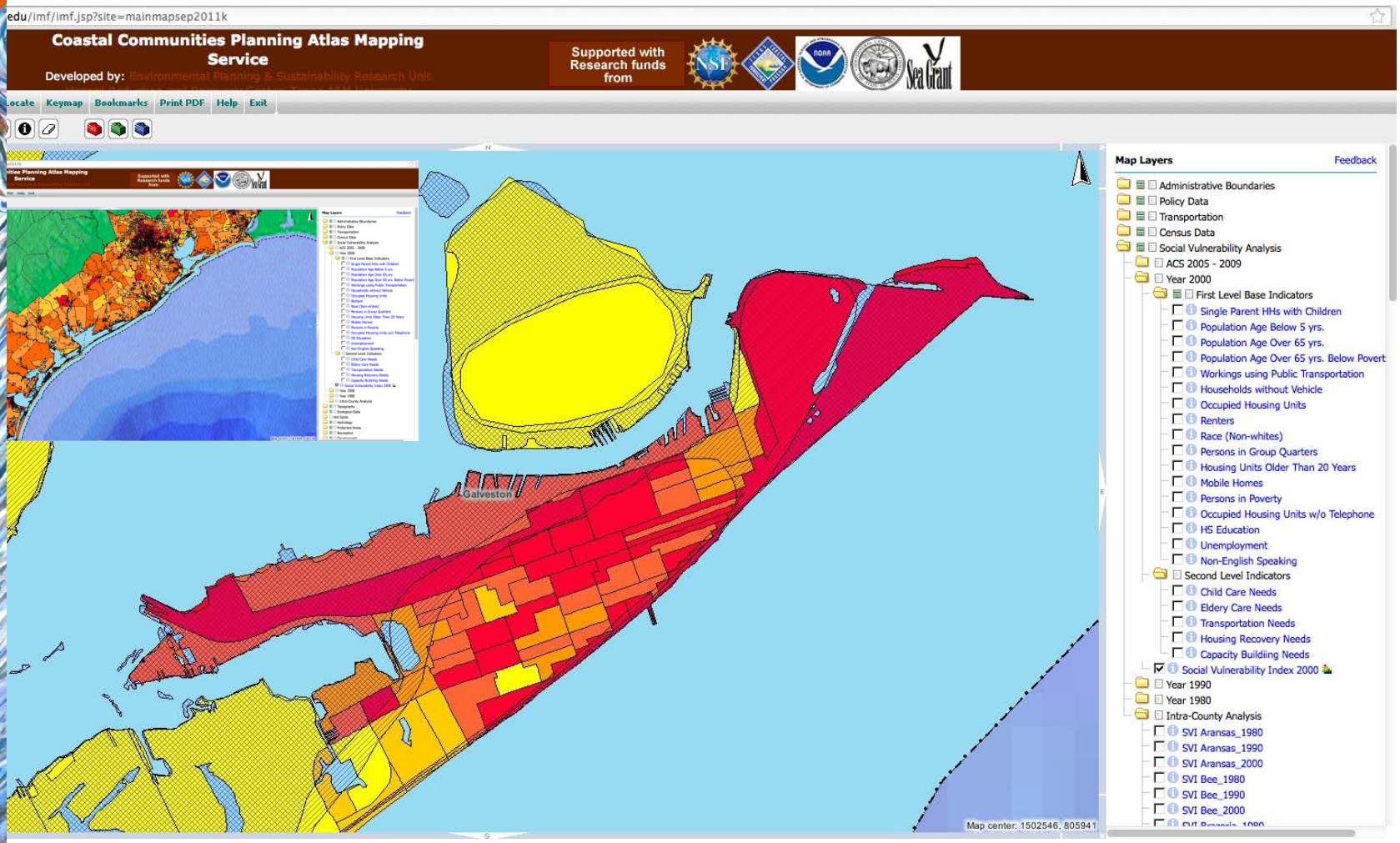
Key for planning efforts

- Critical elements in guiding effective resiliency planning should be the convergence or overlaps between:
  - Hazard exposure
  - Physical vulnerability
  - Social Vulnerability

The overlap represent hotspots that are prime targets for resiliency planning issues whether considering mitigation, recovery, or other planning activities.



Social Vulnerability and Cat 1&2 surge zones



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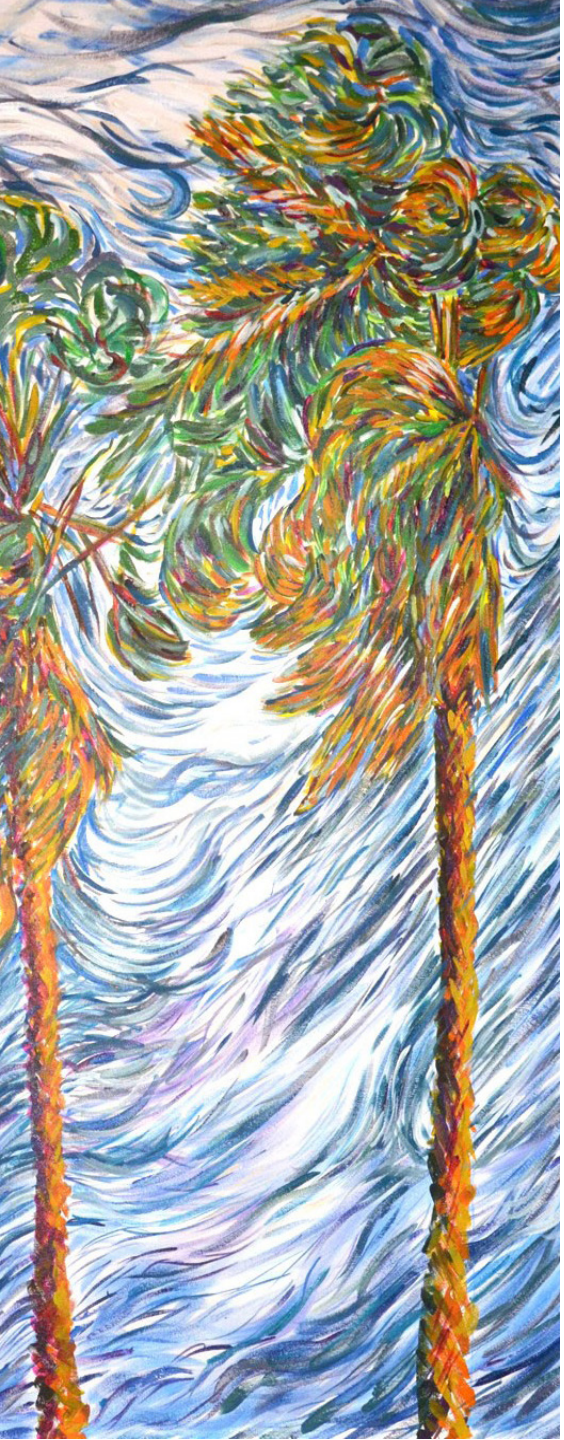
Hurricane Ike: An assessment opportunity

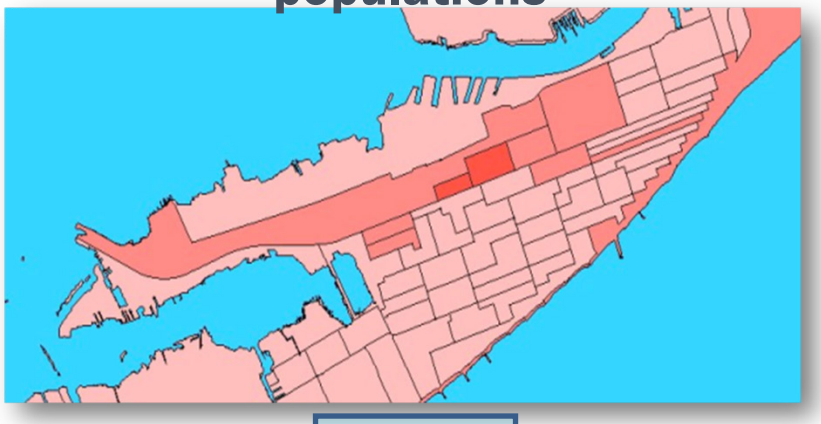
- While our mapping strategy was based on the literature, the question remained as to whether or not this strategy has utility for planning activities, or more specifically the validity of this approach
- Multiple data sources used
  - Primary data: Survey of 1500 single family structures and approximately 550 household surveys
  - Secondary data sources: Galveston permit data and parcel data
  - Aggregated to block group level (67 BGs) and combined with SV measures
    - Note the numbers for the survey data can be quite low when aggregating, but focusing on overall pattern
- Assessment/validity
  - Map comparisons
  - Correlation analysis



PREDICTED

Using the Social Vulnerability Indicators from the Coastal Community Planning Atlas

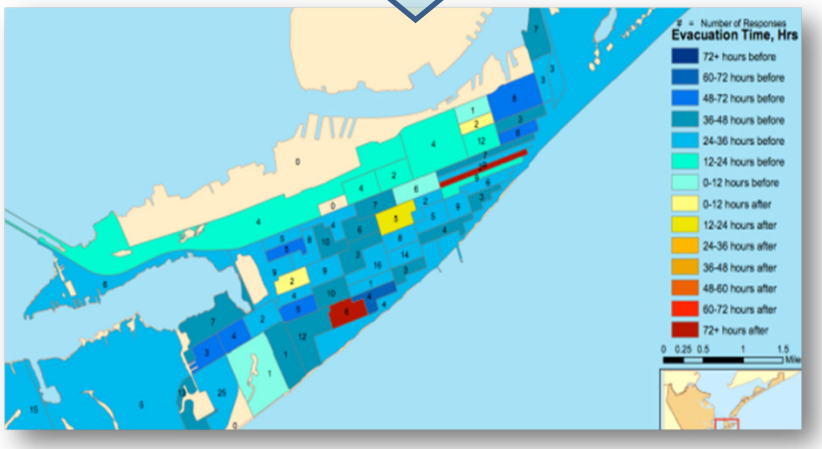
Transportation-dependent populations



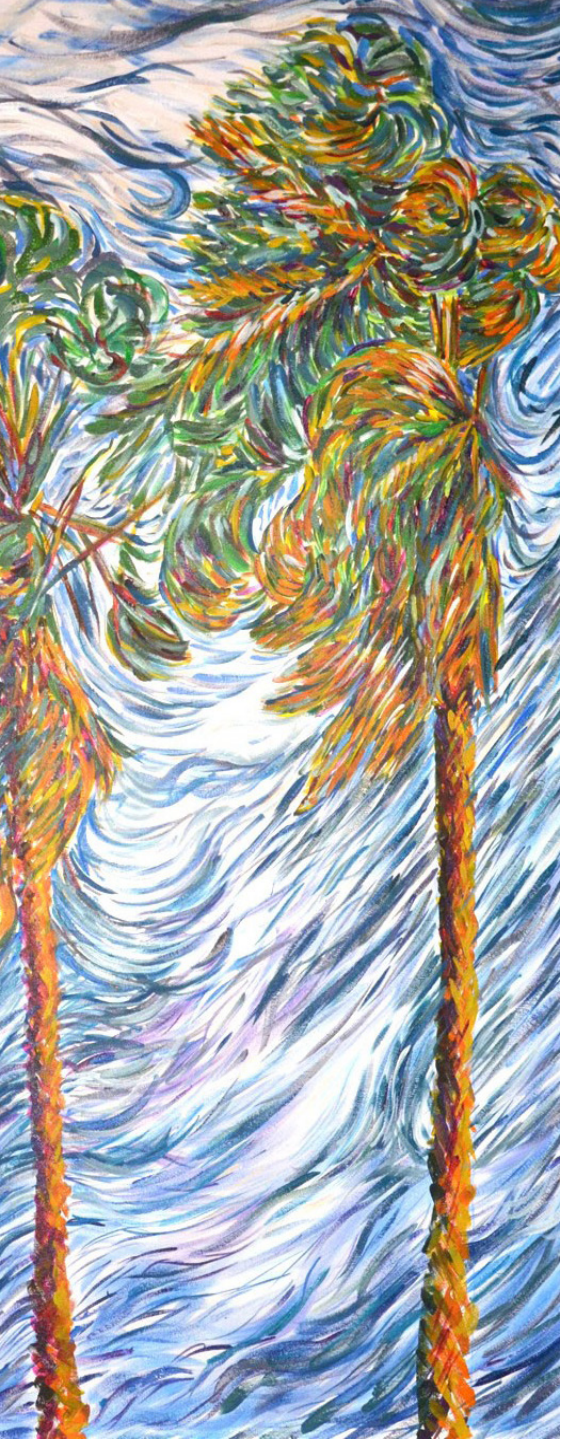
r=-0.249*

OBSERVED

From Primary Data Collected After Hurricane Ike



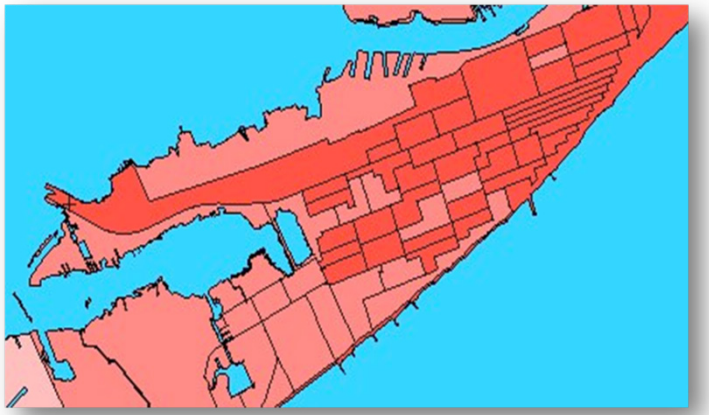
Evacuated later



PREDICTED

Using the Social Vulnerability Indicators from the Coastal Community Planning Atlas

Households with high recovery needs



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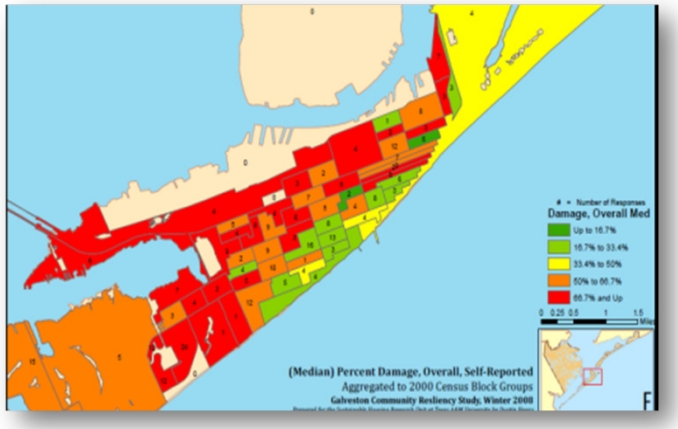
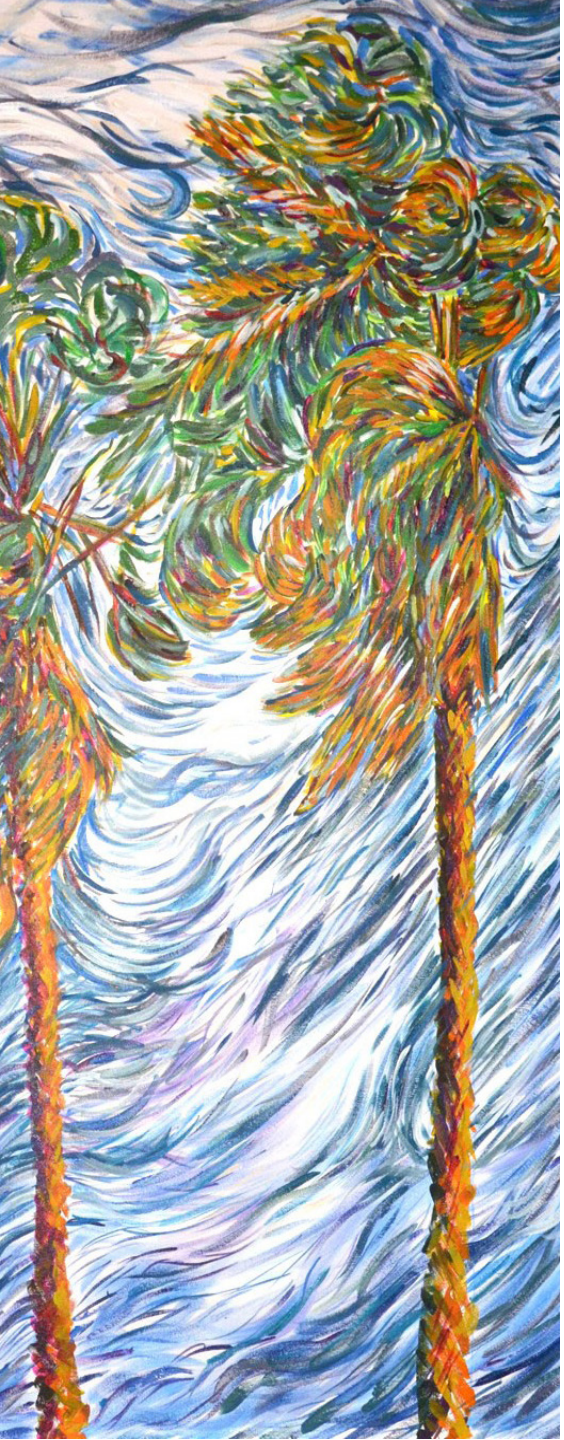


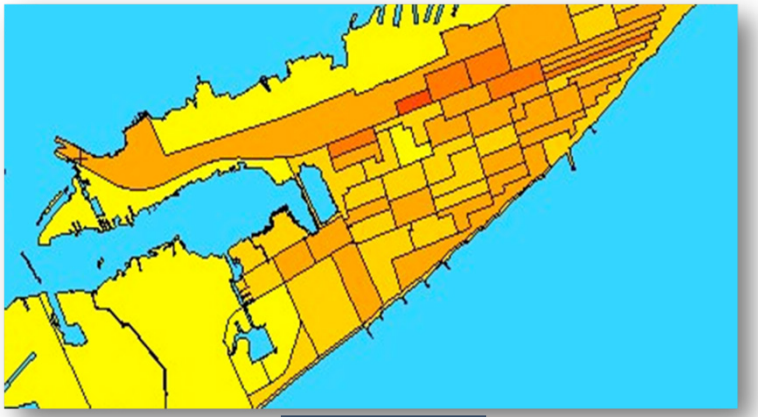
Had higher levels of overall damage



Households with high social vulnerability

PREDICTED

Using the Social Vulnerability Indicators from the Coastal Community Planning Atlas



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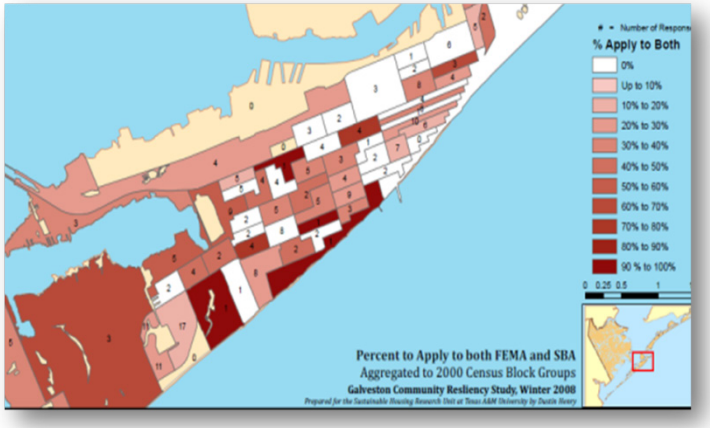

Applied less to FEMA and SBA for aid

Conclusions

- In general support for mapping tool:
  - Evacuation, public/private recovery funding and recovery activities
  - Damage assessment not as supportive
- Next steps:
  - Updated data on recovery trajectories and population losses and funding (insurance, CDBG, etc.)
  - Assessments using the 2005-2009 ACS 5 -year data at block group level
  - Reassessments of 2nd order indices

Policy Implications

- Spatial disparities persist for disadvantaged populations at every stage of disaster response and recovery
- Community planners, emergency management personnel, and civic leaders can identify neighborhoods where targeting can better meet their needs
- Inequities in response and recovery can exacerbate pre-existing inequalities