THE UNIVERSITY
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at CHAPEL HILL

Systemic Risks Associated with Shortfalls in Flood Insurance Coverage

Perspectives from Recent U.S. Tropical Cyclone Landfalls

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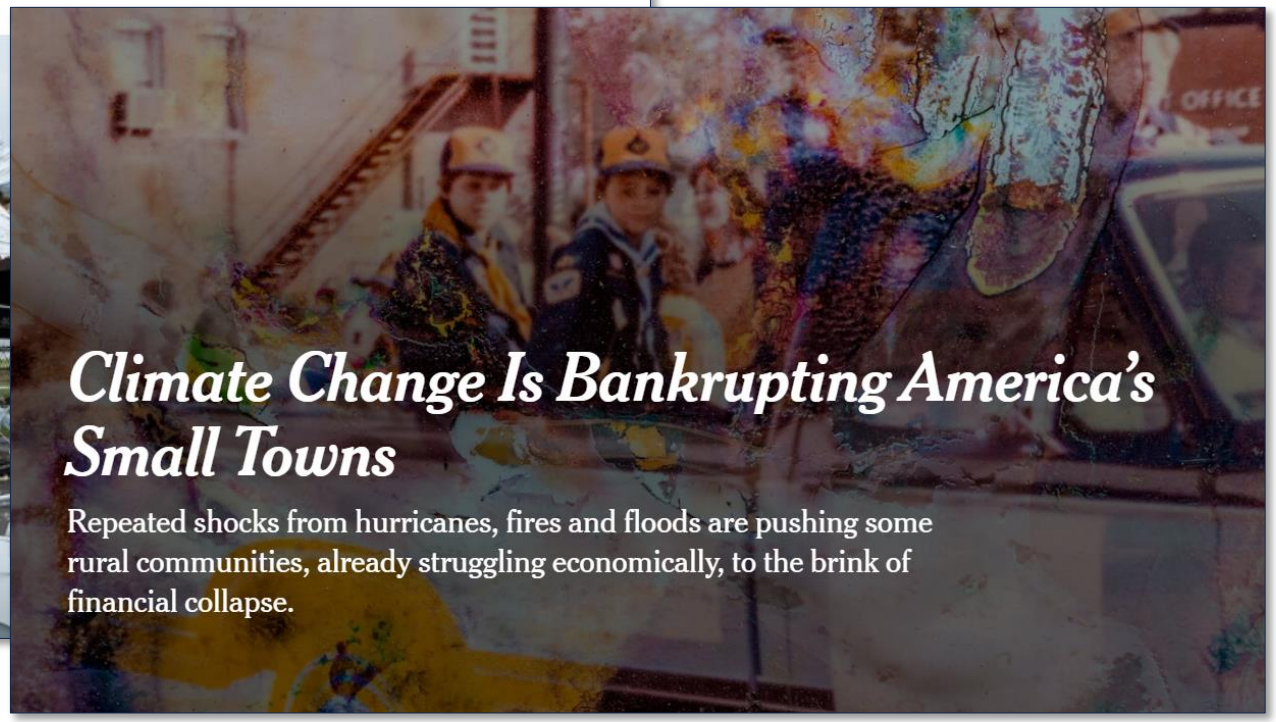
Repetitive hurricane shocks pose significant risks to communities.

CoreLogic Estimates $27 Billion to $40 Billion in Insured and Uninsured Losses from Hurricane [illegible] and Inland Flood[illegible]

—Uninsured losses cou[illegible] Mississippi and Alabam[illegible]

IRVINE, Calif., September 1, 202[illegible] analytics and data-enabled solut[illegible] commercial wind, storm surge ar[illegible] According to this new data analy[illegible] surge and inland flooding damag[illegible] Louisiana, Mississippi and Alabar[illegible] billion.

Nicholas, now a tropical depression, brings heavy rain to the flood-battered South.

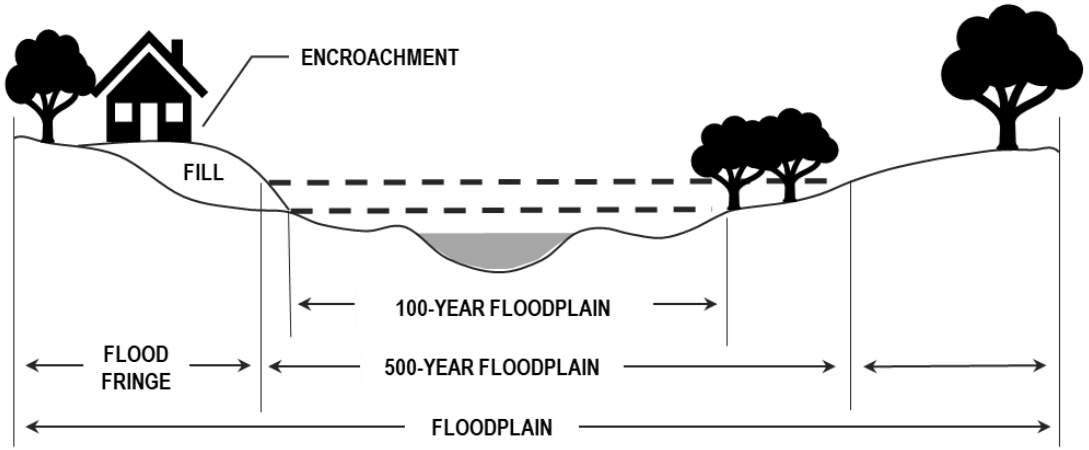


Climate Change Is Bankrupting America's Small Towns

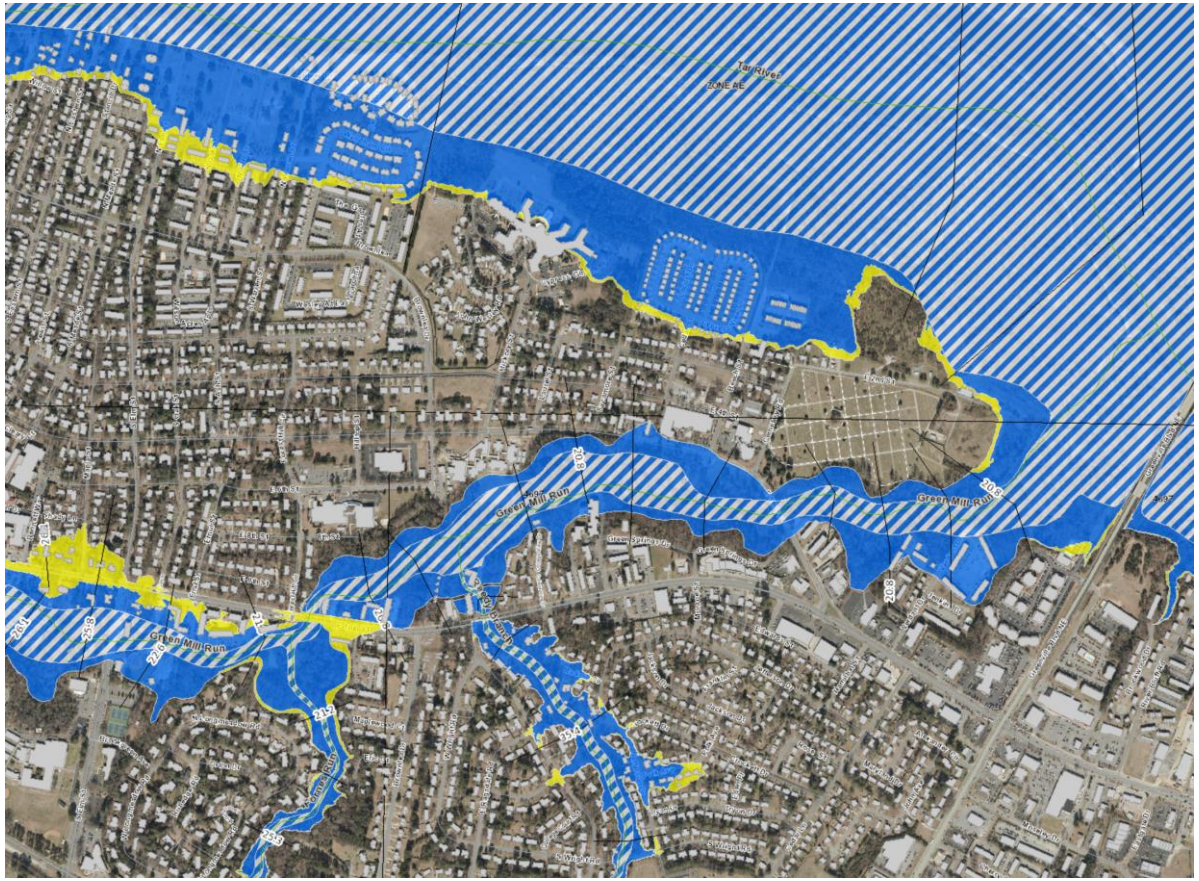
Repeated shocks from hurricanes, fires and floods are pushing some rural communities, already struggling economically, to the brink of financial collapse.

The 100-year floodplain is the primary marker of risk in the U.S. and an important planning tool, but it is poorly understood by the public.

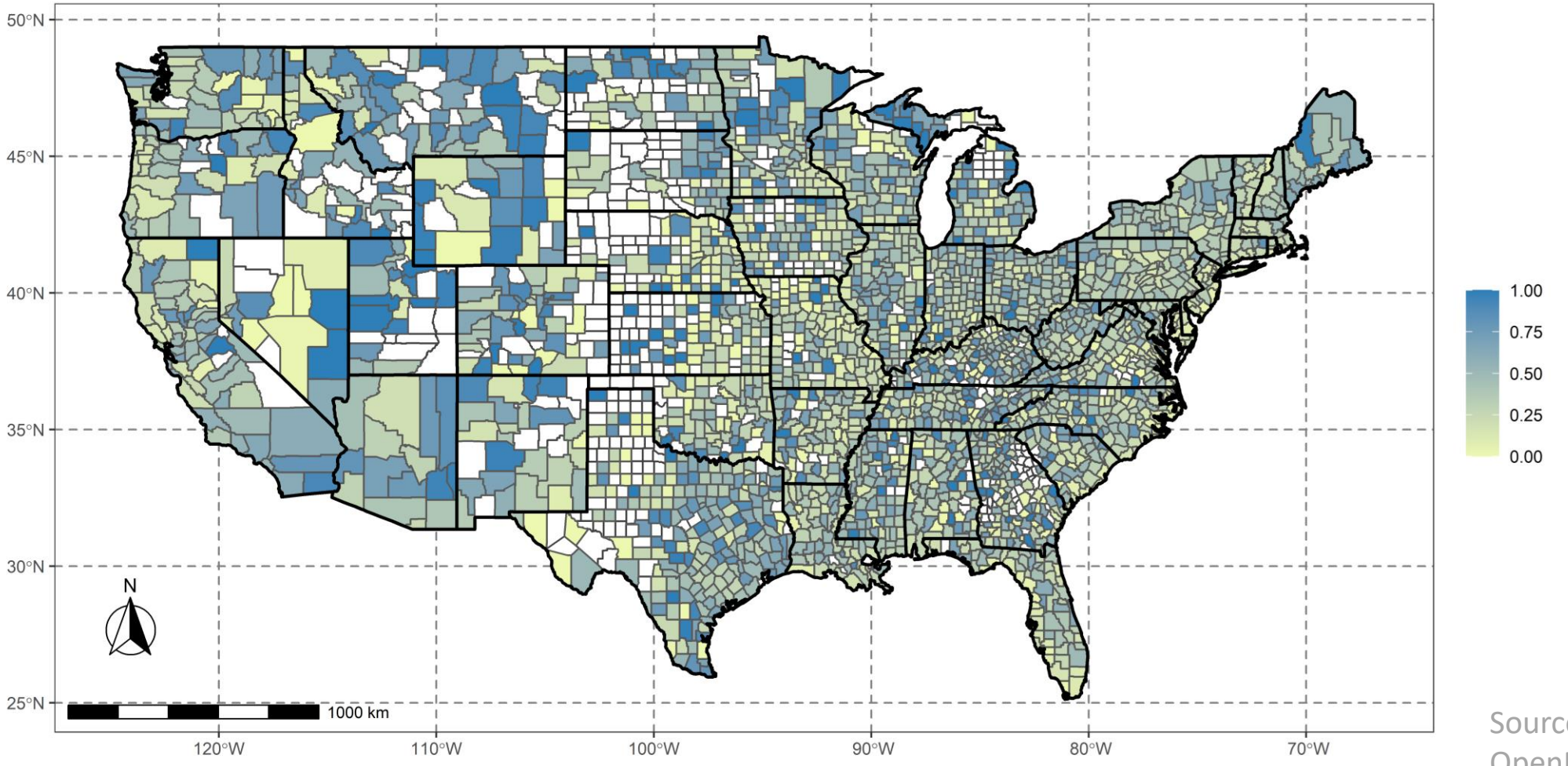
The area with >1% chance of being inundated by a **river** or **coastal flood** in any given year.



It is *not* the area that will only flood once in 100 years. In fact, a home in a floodplain has a **26% chance of flooding** during a 30-year mortgage.



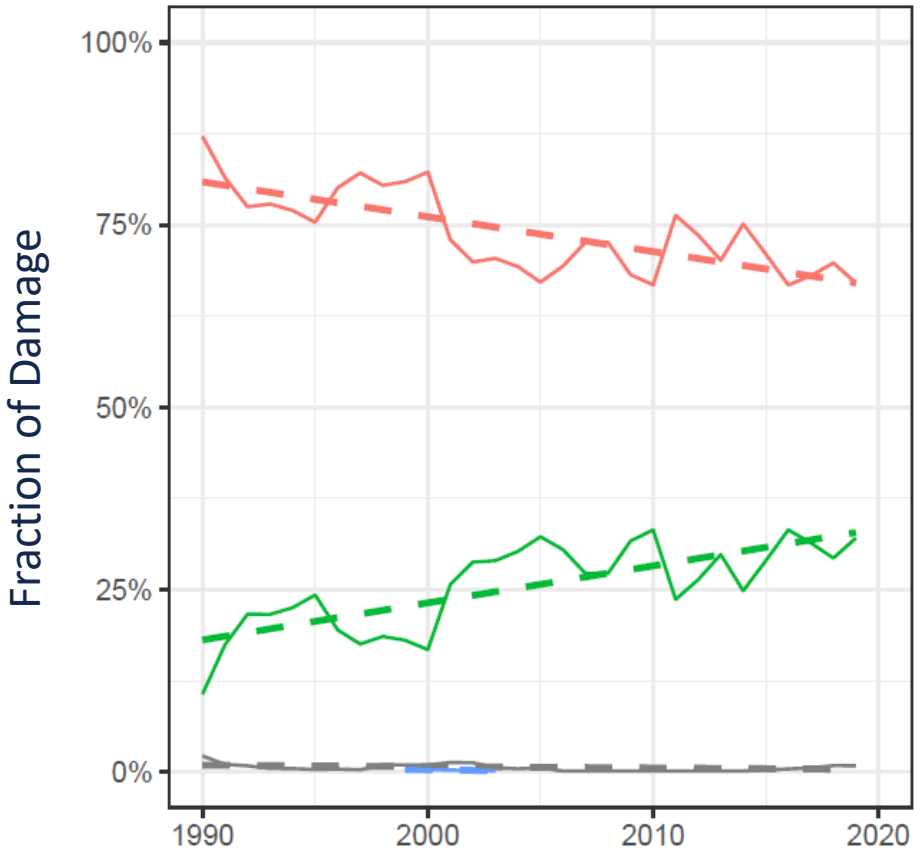
Nationwide, 28% of insured damage has occurred outside of floodplains…



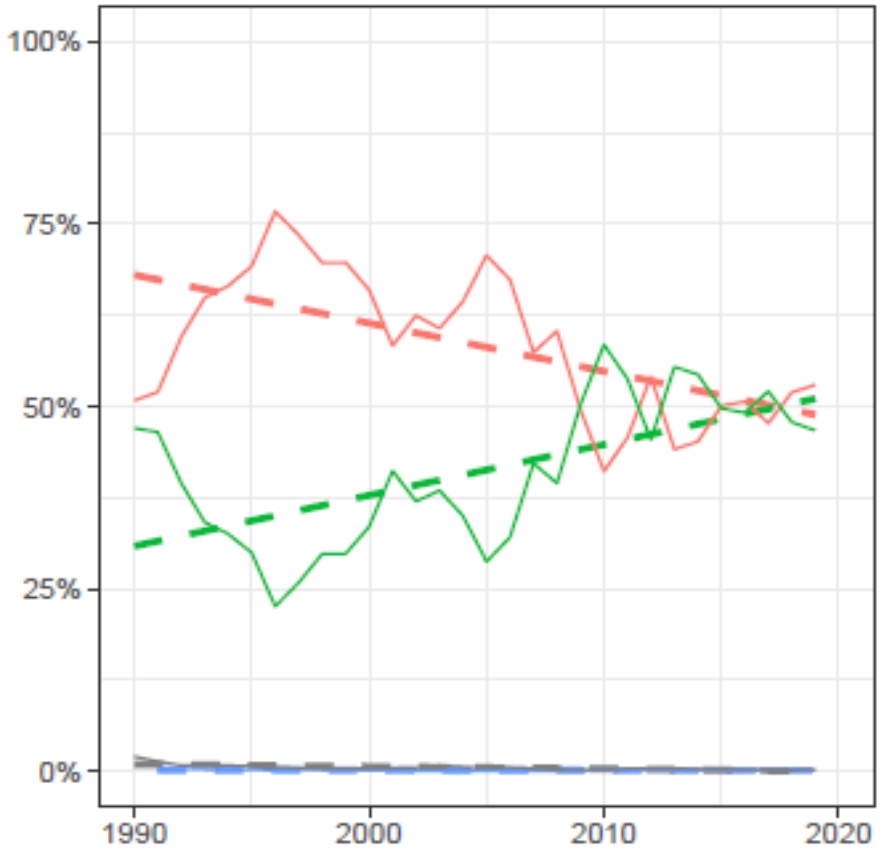
Source: OpenFEMA

... and the rate of damage occurring outside of floodplains is growing.

All U.S. Counties



U.S. Gulf of Mexico Counties



Data Source: OpenFEMA

A large portion of flood risk is unmapped, leaving homeowners and communities unaware and at risk.

Pluvial Flooding:

Photo: David Pfeiffer CC BY 2.0

Compound Flooding:

Photo: AP Photo/Steve

Flooding during Hurricane Florence in Englehard, NC looking towards Pamlico Sound

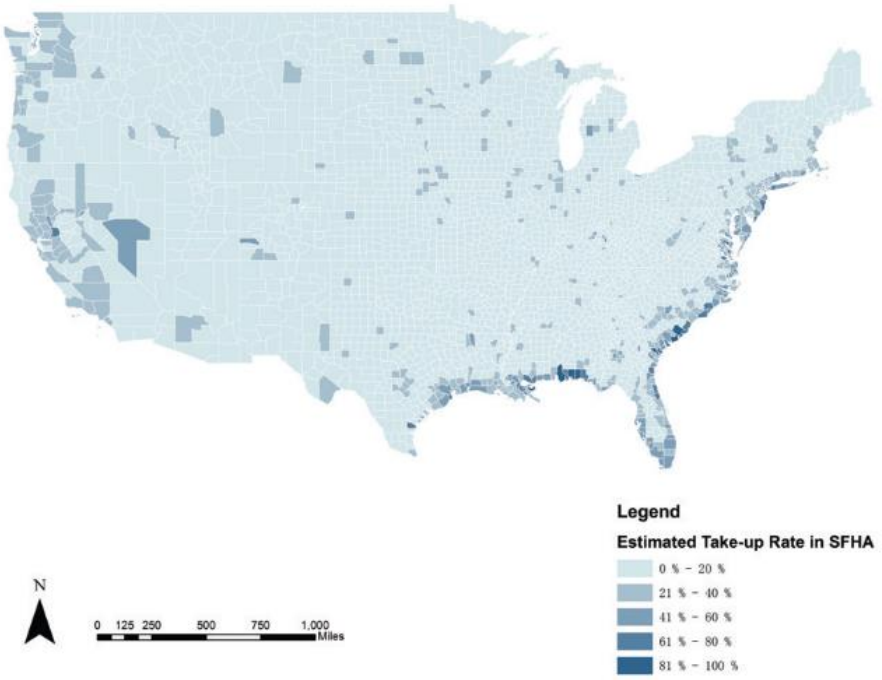
Flood insurance serves as the primary protector for homeowners (and communities), but coverage relative to (mapped) risk remains low.

>95% residential flood policies are NFIP

NATIONAL FLOOD INSURANCE PROGRAM®

FEMA

~30% of households in the floodplain are insured



Source: Produced by the authors with data from FEMA. Take-up rates are based on residential policy contracts and counts of structures.

Kousky et al 2018

Uninsured damage and property value losses can extend to lenders and local governments, threatening the resilience of coastal communities.

Climate Change Floods North Carolina's Housing Market

As sea level and extreme weather risks rise, larger down payments, inequities in insurance, and heirs' properties could leave coastal residents drowning in debt and devalued homes.

1 2

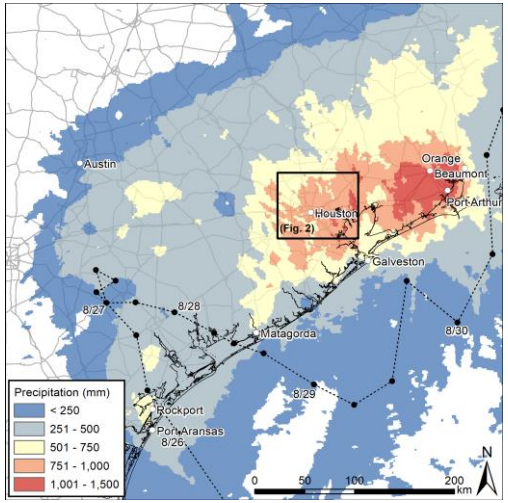
October 06, 2020 | Jodi Helmer

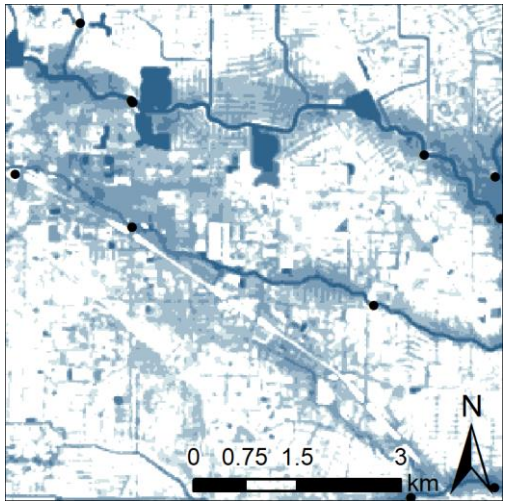
Uninsured owners may borrow against the value of their property in order to recover from flood events

Property values may decrease* after flood events which increases uncertainty about resale value

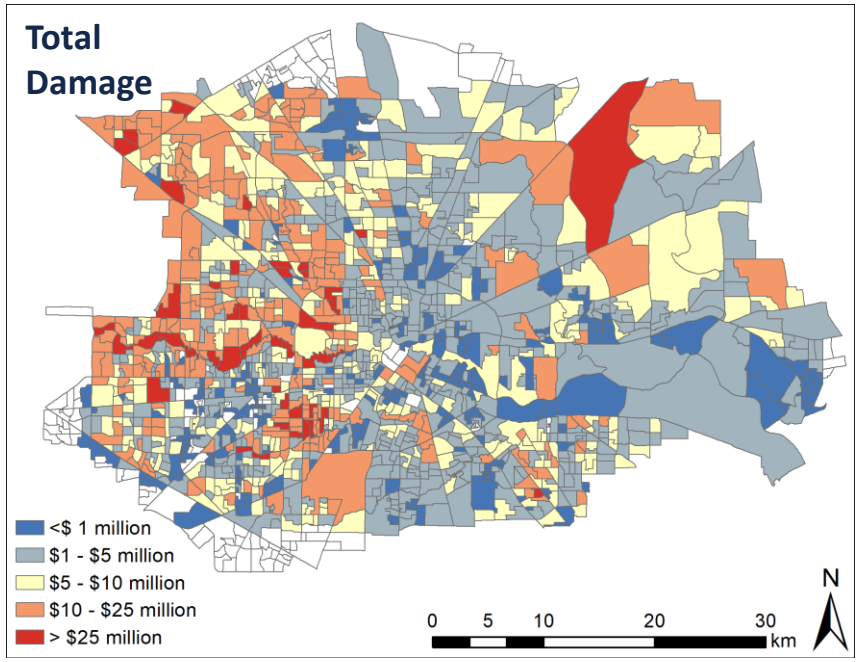
*our preliminary work suggests decreases are more likely to occur in areas where property values are already low

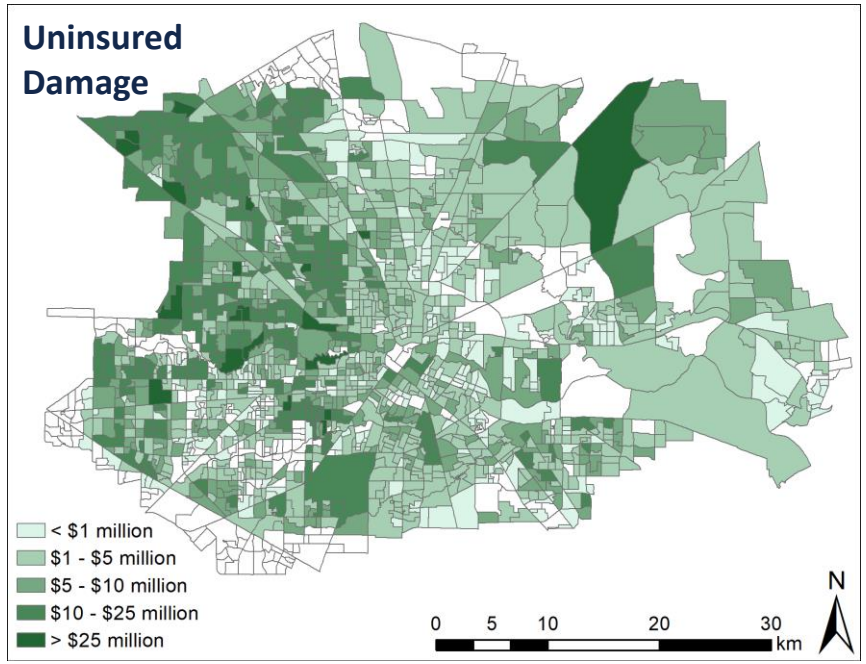
Recent landfalling tropical cyclones underscore this issue: Harvey





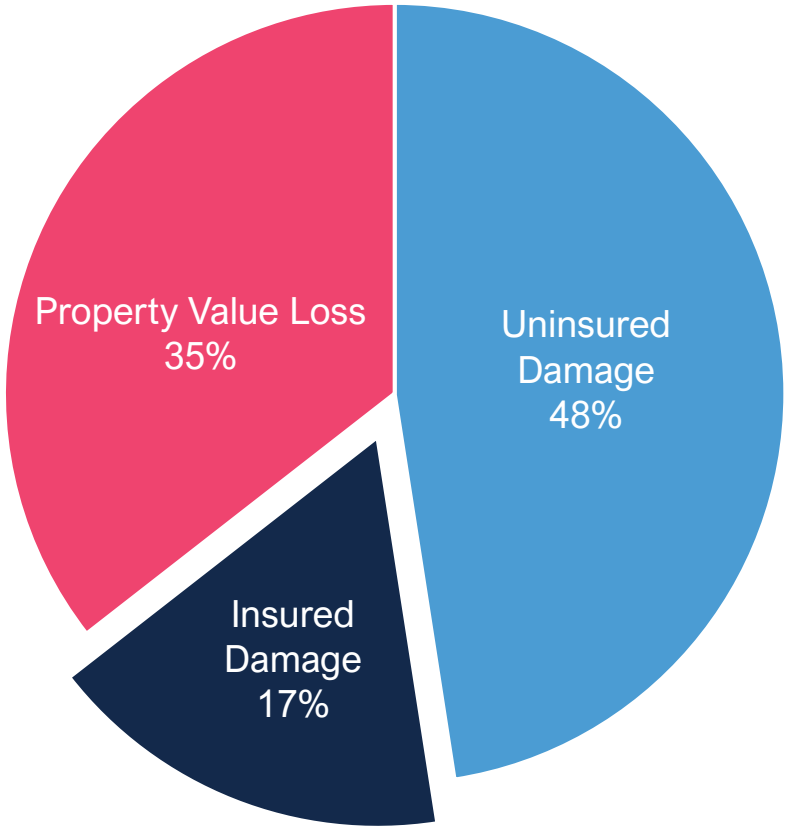
- Hurricane Harvey made landfall in August 2017
- >40 in (1000 mm) of rain in 4 days; est. 15% increase due to climate change
- $11.1B residential flood damage (within the model domain)
- $8.3B (75%) of the residential flood damage was uninsured
  - Majority of this damage came from sources that were ‘unmapped’





Sebastian et al. 2021 *Natural Hazards*

Recent landfalling tropical cyclones underscore this issue: Florence



Total Losses
$2.16B

Are Properties at Risk of Default or Abandonment?

Who holds the risk?

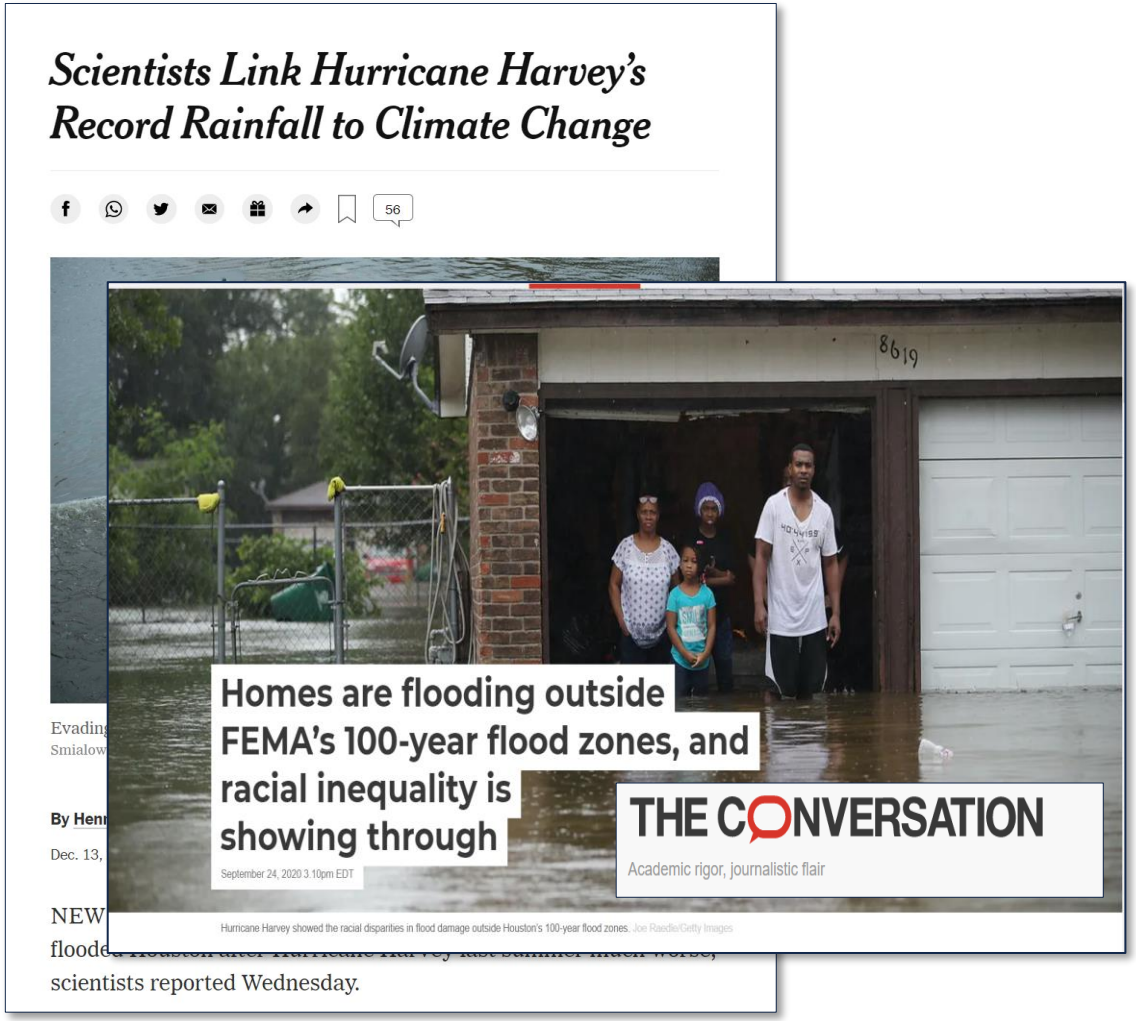
Financial Risk*
$850M

*not all of this risk is realized

Thompson et al. *in prep.*

Concluding Remarks

- Better estimates of current and future flood hazards are urgently needed to help identify at-risk properties
- Federal flood insurance provides critical protection to homeowners *and* the community institutions that support them (incl. lenders, local government)
- Climate change and development pose systemic risks to communities, especially in coastal areas
- The distribution of financial risk after floods differs across geographic and socio-demographic boundaries. Climate change threatens to exacerbate socio-economic disparities between communities.



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