

# Flood Risk and Resilience: Moving the Needle on Research and Outreach

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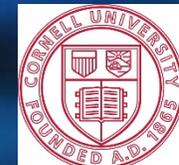
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Tampa, FL

Thursday, April 18, 2019



New York State  
Water Resources Institute  
Cornell University



Cornell University  
Community & Regional  
Development Institute (CaRDI)

# Partners, Funders, Collaborators

## **Partners**

- Robin Blakely-Armitage, David Kay, Lindy Williams, Jack Zinda, and Sarah Alexander
- Water Resources Institute (WRI)/NYS DEC
- Hudson River Estuary Program (HREP)

## **Funders** (WRI, Hatch/Smith Lever)

- Water Resources Institute – Focus on Outreach Implications
- Federal Funding – Hatch (Research) & Smith Lever (Extension) – Focus on Potential Migration Impacts from Climate-Change related flood risk

## **Collaborators**

- Cornell Climate Change and Flood Resiliency Group

# Purpose of Project

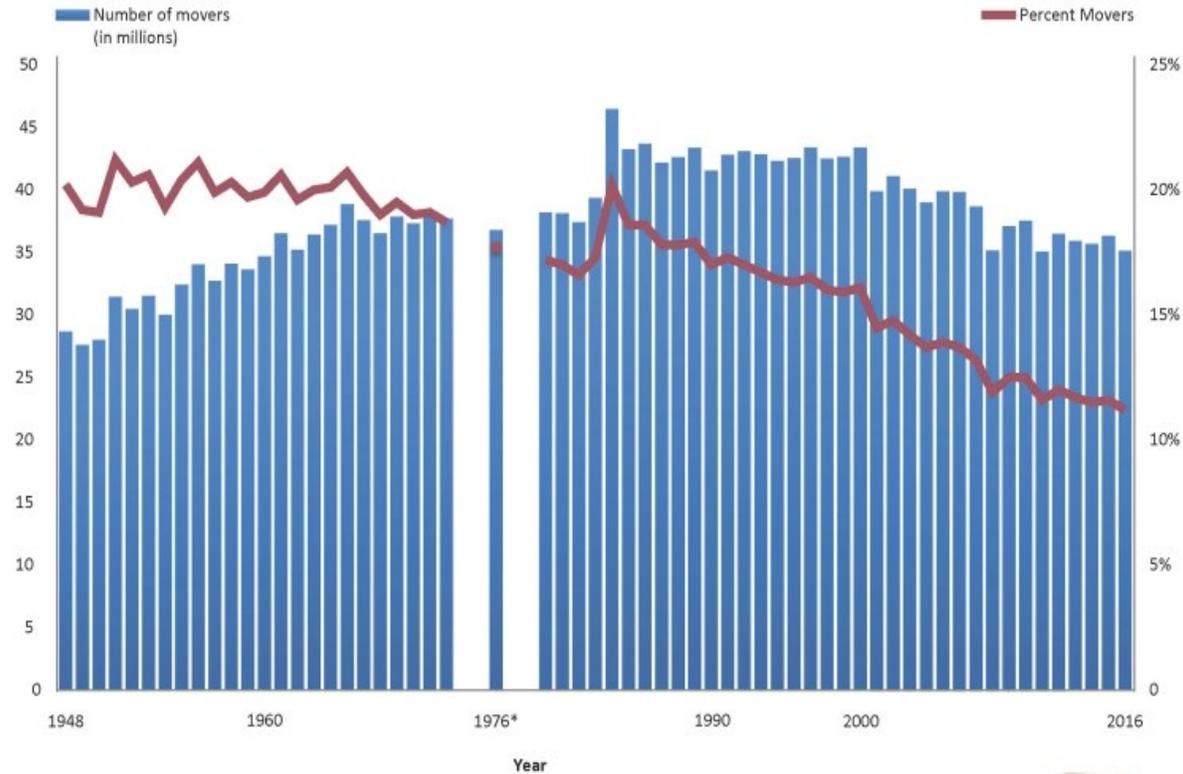
- Better understand the various *dimensions* of flood *risk* – critical with climate change related impacts
- Understand how *perceptions* of flood risk are related to adaptation and mitigation strategies
- Understand how *responses* to risks vary from one community to another
- Understand how varying perceptions of risk should inform/influence:  
a) outreach strategies b) local policy
- Situate our investigation with consideration of *climate migration*

# Climate Migration: A Growing Concern

- How will flooding or perceived flood risk develop as a “push factor”?
- Migration as adaptation

# Moving in America

## U.S. Mover Rate at Historic Low

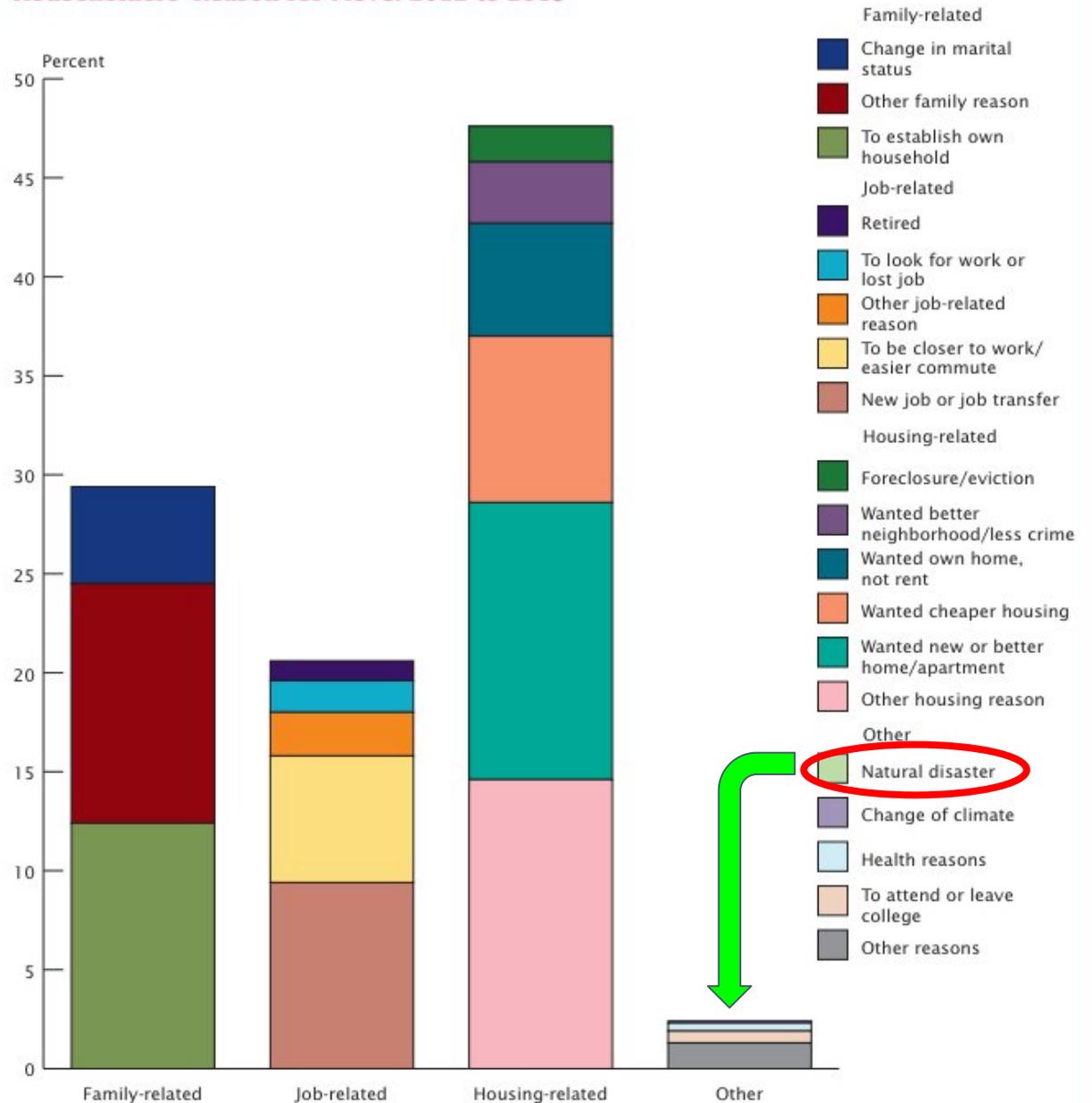


\* The one-year geographic mobility question was not asked between 1972-1975 and 1977-1980. Applies to the population age one and over.

11.2%  
2016 U.S. Mover Rate

Source: Current Population Survey 1948-2016  
[www.census.gov/programs-surveys/cps.html](http://www.census.gov/programs-surveys/cps.html)

Figure 2. Householders' Reason for Move: 2012 to 2013

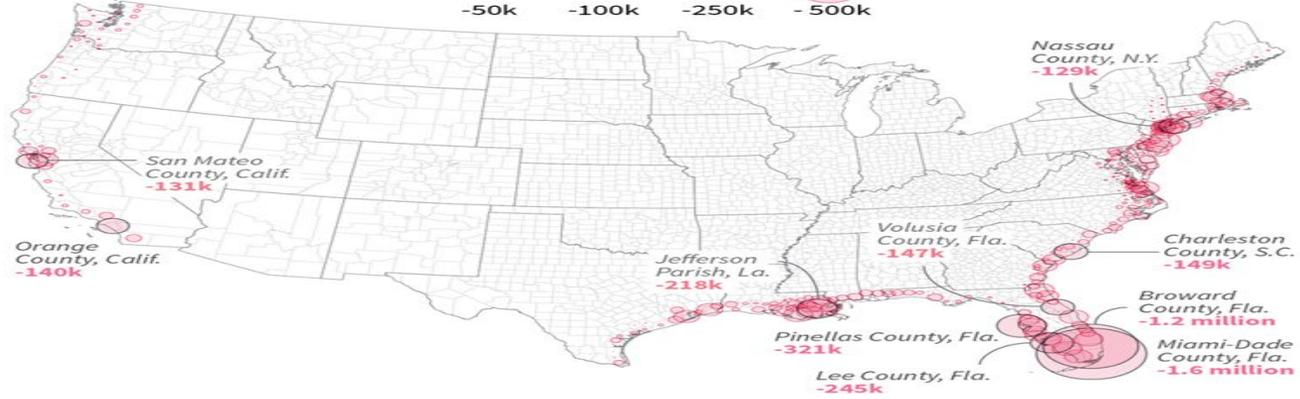


Source: U.S. Census Bureau, Current Population Survey, Annual Social and Economic Supplement, 2013.

# Heavily Populated Coastal Communities Could See Massive Population Changes Due To Sea Level Rise

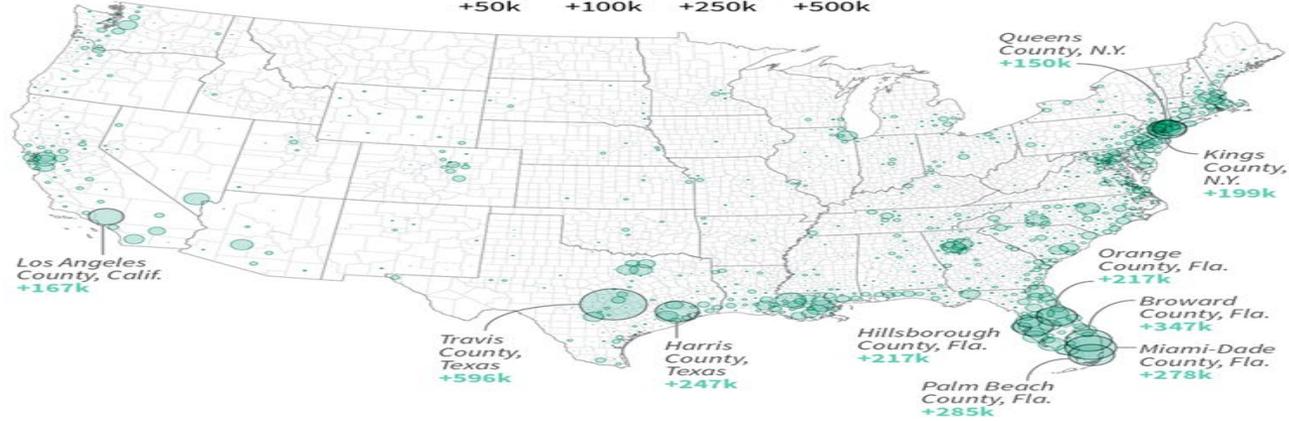
## Where people will come from:

Total population **loss** due to sea-level rise between 2010 and 2100\*



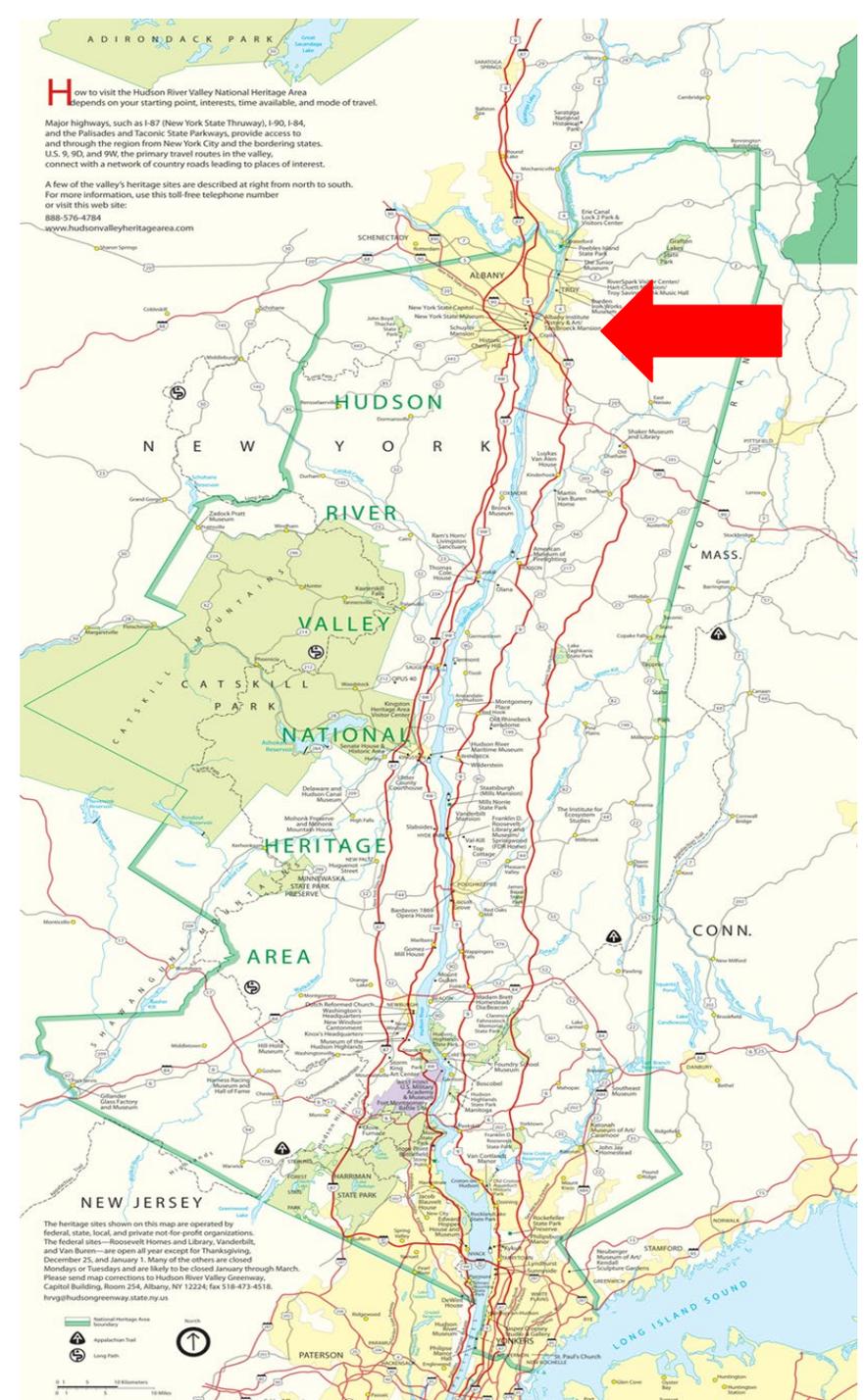
## And where they'll go:

Total population **gain** due to sea-level rise between 2010 and 2100\*



\*Adjusted to account for high-income residents who will be able to adapt their homes to sea-level rise.  
Source: Mathew E. Hauer, "Migration induced by sea-level rise could reshape the US population landscape," Nature

# Our Pilot Site: Troy, New York



# A History of Flooding in Troy, New York



1911 Flood aftermath  
Troy, New York

2013 Flood aftermath  
Troy, New York



# “My Drowning City Is a Harbinger of Climate Slums to Come”



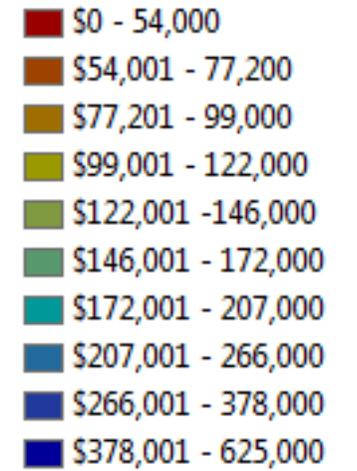
Article in *The Nation*,  
August 16, 2016, by Virginia Eubanks (Troy resident)  
<https://www.thenation.com/article/low-water-mark/>

Addresses the complex intersection of:  
Increased flood risk, federal flood insurance challenges,  
Biggert-Waters legislation, “Climate Redlining”, housing  
values, climate justice, etc.

# Approaches and Methods

- Analysis of demographics, flood zone maps, and other related documents
- Review of local press coverage
- 10 semi-structured interviews with local professionals and residents
- 4 focus groups (2 in May 2018 & 2 in September 2018)
- Key variables: poverty, flood experience, rental/owner, etc

# Full Residential Assessed Value



 Focus group location



Flood Risk:  
FEMA  
Maps  
1980  
base  
map

North  
Troy

South  
Troy

Downtown  
Riverfront

Downtown  
Seawall

TROY  
DAM

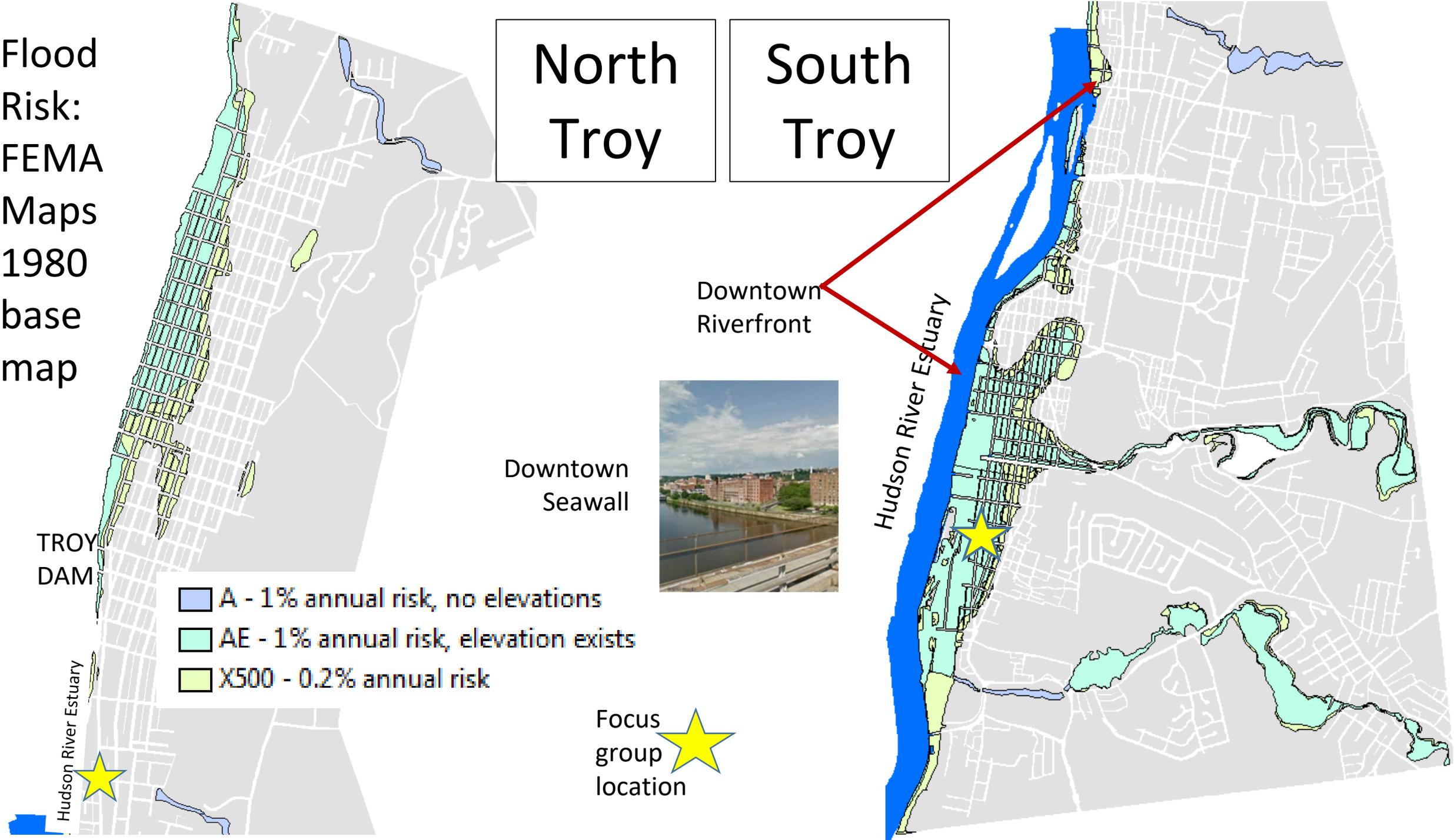
Hudson River Estuary

Hudson River Estuary

- A - 1% annual risk, no elevations
- AE - 1% annual risk, elevation exists
- X500 - 0.2% annual risk



Focus  
group  
location



# Discoveries from interviews fall within 4 thematic areas:

1. Unknown Flooding Risk
2. Uneven Exposure to Material and Financial Risks
3. Factors Influencing Perceptions of Risk
4. Community/Civic Capacity

# Theme #1: Unknown flooding risk

## Examples:

- The **exact natures of the risks** in our case City are still **not well understood**.
- **No single, universally accepted “objective” benchmark for defining the extent and nature of *future* flood risk**  
– will influence how we think about, represent, and interpret “subjective” perceptions of risk.

# Theme #2:

## Uneven exposure to material and financial risks

### Examples:

- Many residents have **little choice about where they live** and the **responsiveness of local government**.
- Perception that **lower income neighborhoods (and residents' interests)** are not being protected in the same way **higher income areas** are.
- **Paved developments in higher income, higher elevation areas** may reduce absorption and increase water running down to areas of lower elevation, often into lower income neighborhoods.
- The risks of rising **flood insurance rates** impacts property owners and renters – is very confusing and may lead to being **under-insured**, particularly for the **vulnerable**.

# Theme #3:

## Factors Influencing Perceptions of Risk

### Examples:

- Industrial development on riverfront renders the river and potential risks “invisible”
- Many people don't see flooding as a major issue or one that is immediately salient.
- Little or no communication regarding flooding or flood risk. The exception seems to be linked to flood insurance
- How we frame and conceptualize the risk of flooding in relation to other risks is important

# Theme #4: Community/Civic Capacity

## Examples:

- Residents perceive a lack of coordinated social and civic organizations directly addressing flood risk – may limit capacity for organized flood effort; though city also has very active organization of neighborhood groups.
- Interviewees perceive a “conservative” city council, and question – will “environmental” issues be given attention?
- Municipal efforts to protect downtown. Some raise questions that these efforts are at the expense of North and South Troy and that city improvements aren't evenly distributed. Raising flood wall may have some down sides.

# Thematic areas from focus groups include:

- 1.Attachment to Place/Attachment to River
- 2.Concerns about current neighborhood:
- 3.Perception of Risk
- 4.Flood insurance
- 5.Other

# Focus group themes:

## Attachment to Place/Attachment to River:

- Strong attachment to community among some, others see negative changes, decay
- Some place important personal value on proximity to river (views, sense of calm, fishing, etc); others ignore it or see negatives (water quality, pollution, contaminants, etc.); some historic negative associations (e.g., no windows on river side of house is older homes); living on versus living near the river
- River is largely seen as underutilized and undervalued
- Some pride in river being unique, estuarine, part of the Great American Boat Loop route

## Concerns about current neighborhood:

- Positive development can lead to gentrification and displacement of lower income
- People moving in and out of city, different value structures (less concern for community), some distrust between groups
- Some distrust and general unhappiness with local government and responsiveness

# Focus group themes:

## Perception of Risk:

- Flooding is seen as a real risk by some, but others face more immediate risks
- People hear warnings, take temporary measures and hope for the best
- Difference between home owners, those who live in flood plains, etc.
- “Risk” is still somewhat contingent, and abstract, for some residents
- Newer residents (renters and owners) seem less aware of flood risk than longer term residents (renters and owners)

## Flood insurance:

- Cost of flood insurance can be a burden, and may limit resale of home
- Some flooding as a result of CSO and poor/aging infrastructure
- No renters had flooding riders on rental insurance; some owners opted in and purchased insurance when not required

## Other:

- Herd immunity
- “Don’t talk about climate change!”

# Additional Questions to Inform Outreach:

- How are different sources of information received and are they perceived as credible?
- How should differences among landlords, tenants, and owner-occupiers shape how risk and information about risk are distributed?
- How do different scenarios of risk influence residents' actions? i.e. what is the "tipping point" for different people?
- Explore scenarios of different interventions (buyouts, improved infrastructure, etc)
- How do FEMA policies and risk mapping shape behavioral response? What other tools influence perception of risk and/or action?

# Next Steps

- Design a survey to establish benchmarks for awareness and perceptions of flood risk in Troy (prior to implementation of HREP programming); revisit after programming
- Continue exploration in additional NYS communities

# Thank you!

For more information, please contact:

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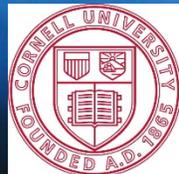
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