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ADAPTATION INFRASTRUCTURE AND CLIMATE GENTRIFICATION

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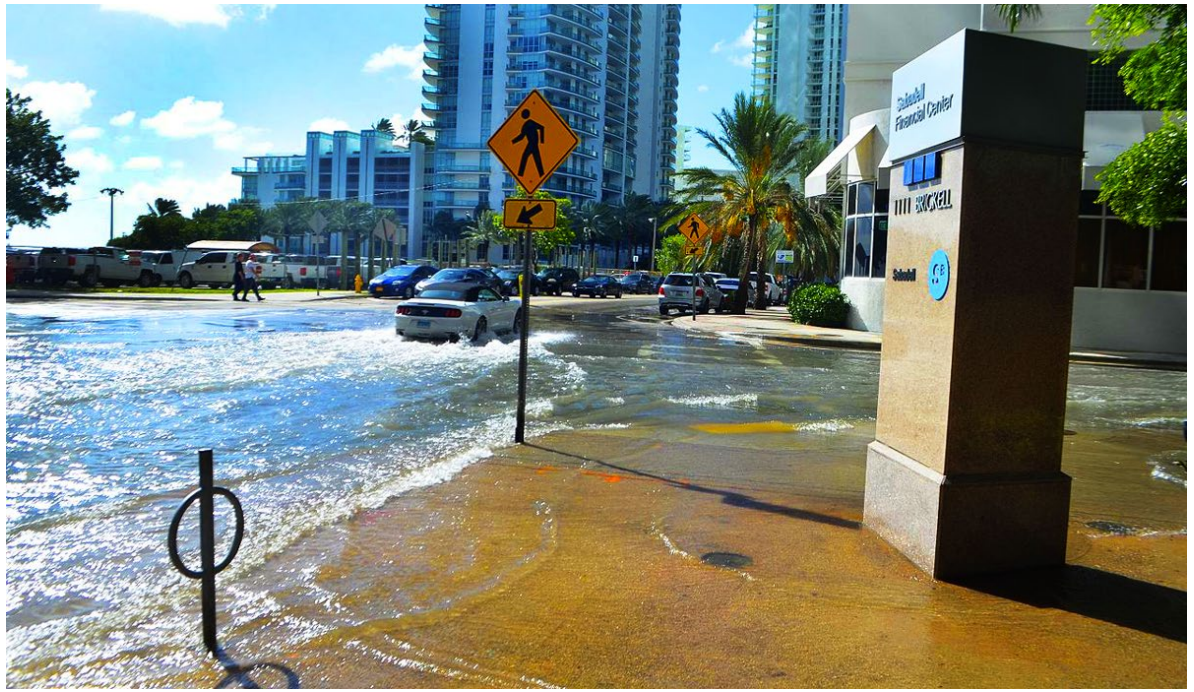
Motivation



- Temperatures have already risen by about 0.9℃
- Will continue to rise for some time, even in the unlikely event of immediate action to reduce carbon emissions.
- Individuals, corporations, and governments need to adapt and become resilient to adverse climate change impacts.

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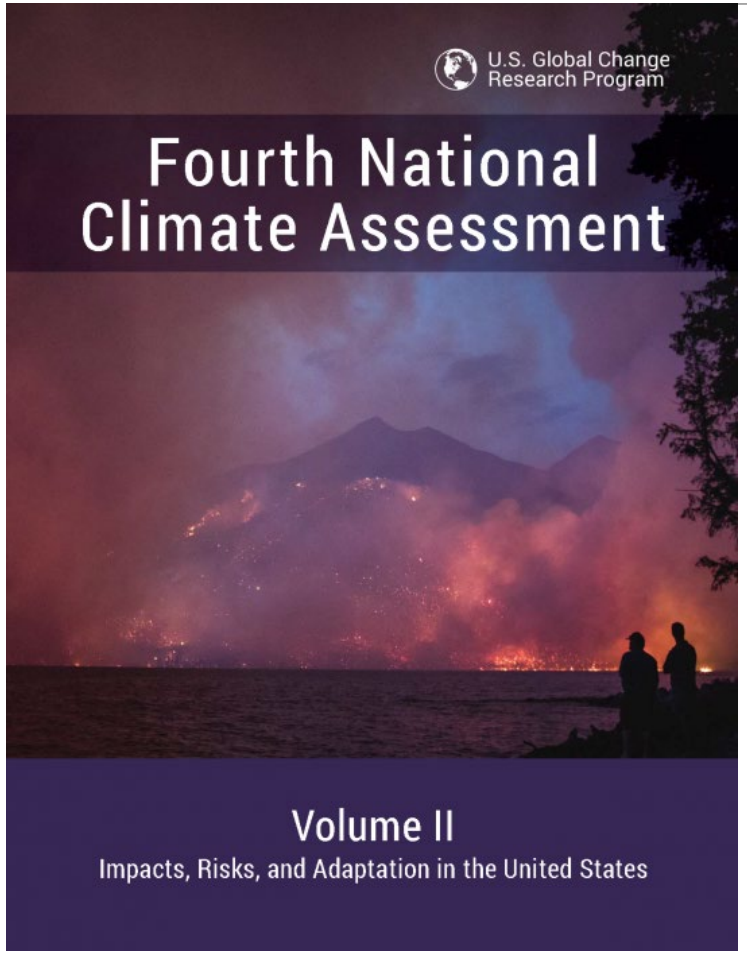
Potential of Adaptation and Resilience



- 4th National Climate Assessment: Cumulative discounted property damage from sea level rise can be reduced by $900B (90%) using adaptation!
- IF we know perfectly how the climate changes and IF adapt optimally. Big “ifs”
- Potential problems: lack of funds, NIMBY, poor risk perceptions, uncertainty.

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Gentrification and Health

Climate Gentrification:

1. Climate change will cause property values in high-elevation areas will increase.
2. Low income/disadvantaged households will end up in vulnerable areas with low property values.
3. Health impacts of climate change (e.g. disease spread by flooding) will be borne disproportionately by disadvantaged households.

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Questions

1. Can we test for gentrification and health using resilience infrastructure projects?
2. How does Infrastructure affect gentrification and health?

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Evidence for Gentrification

- Anecdotal evidence that climate gentrification is happening, but:
- Problem 1: macro-shocks (Great Recession, Covid) affecting all areas. Difficult to see neighborhood changes when all prices are going up.
- Problem 2: prices and health outcomes vary by neighborhood and elevation due to historical housing quality differences, not necessarily due to gentrification.

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Our Solution: Quasi-RCT

- Would like to assign elevations to neighborhoods randomly across time and space, then observe gentrification and health outcomes, like a randomized control trial (RCT).
- Our approach: resilience infrastructure projects is similar to changing the elevation in that more protected areas are created, which should cause gentrification and changes in health outcomes, relative to areas with no change in protection (Quasi-RCT).

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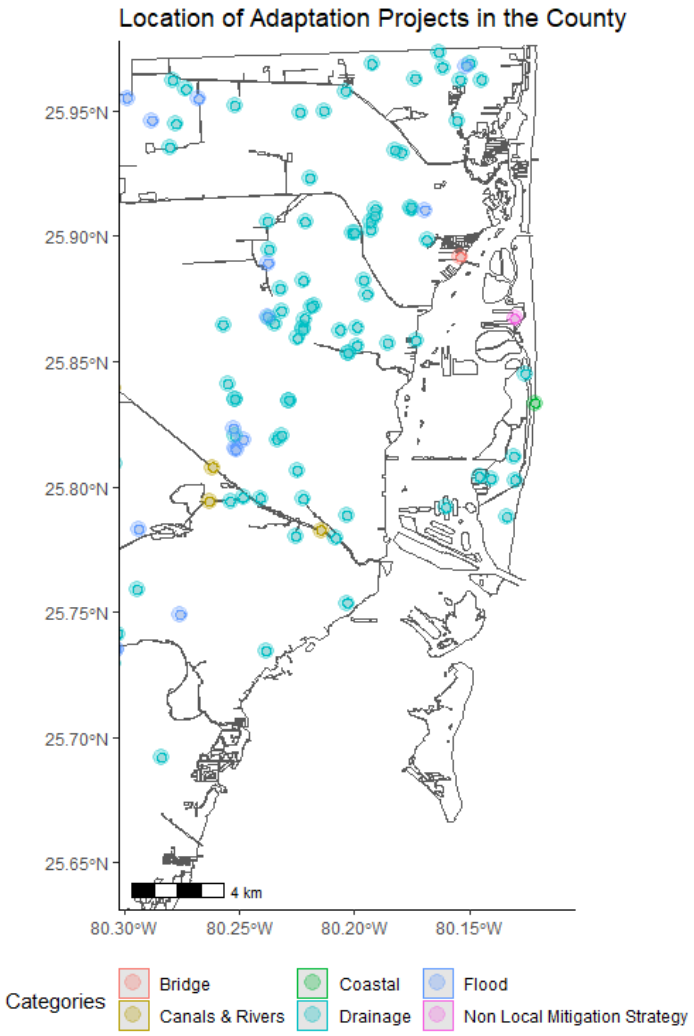
Projects Map



- 162 infrastructure projects completed in 2000-2016.

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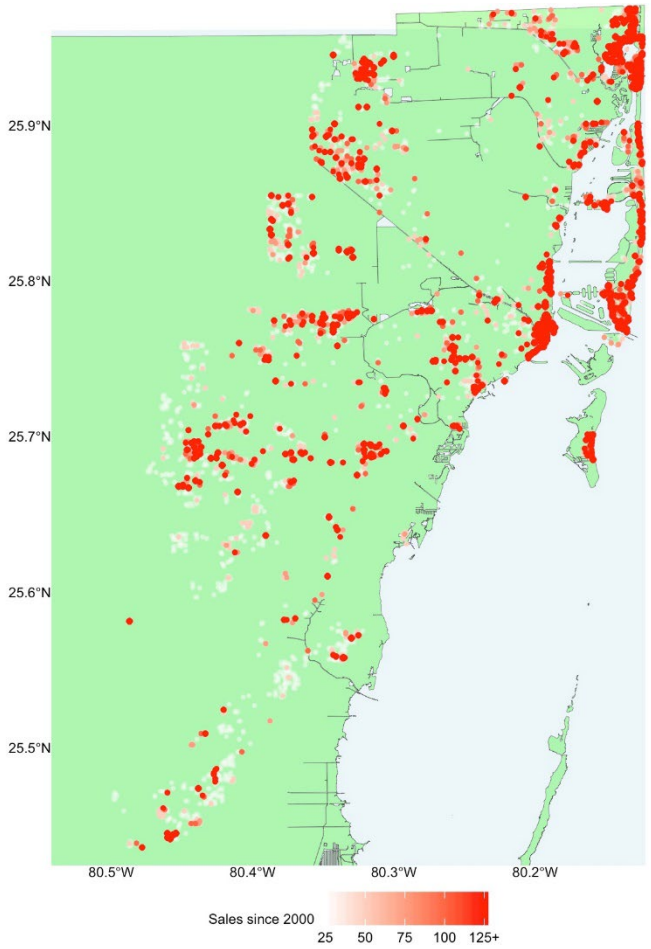
Property Transactions Heat Map



430K+ property transactions used to estimate effect on property values.

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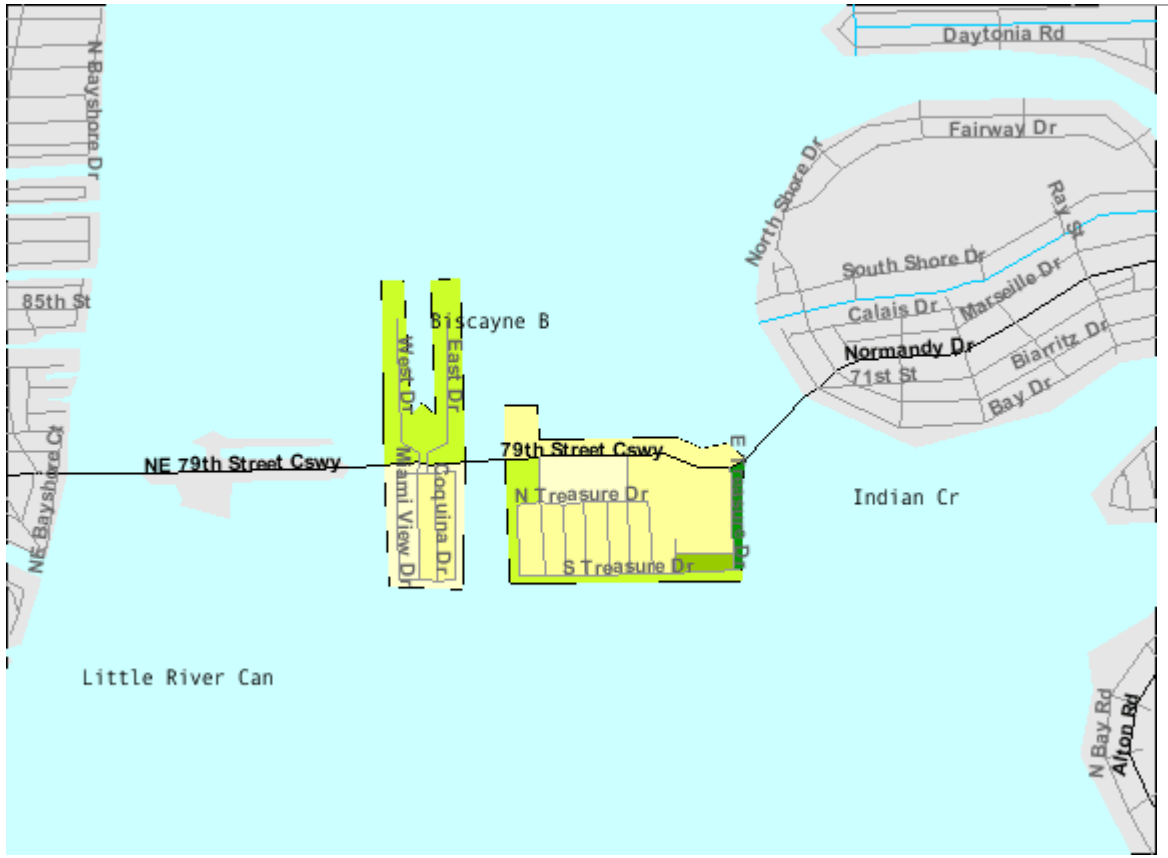
Example Project



- North Bay Village: man-made island built from construction fill.
- Essentially at sea level.
- 30 total items, including sea wall repair, drainage wells, stormwater outfall repair, pumping station, bay restoration, and moving power lines underground.

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Results

	(1)	(2)	(3)	(4)	(5)
Property Value Increase After Completion	5.3**	5.4**	4.4**	4.6**	4.6**
Decline in Property value Increase After Completion, 1% farther from project	1.5***	1.6***	1.4***	1.7***	1.7***
Controls					
Size, condo, location		x			
project			x		x
property				x	x
Year, zip code	x	x	x	x	x

Step 1: show that projects change property values

Result:

About a 5% gain in property value after completion.

** 95% significance

***99% significance

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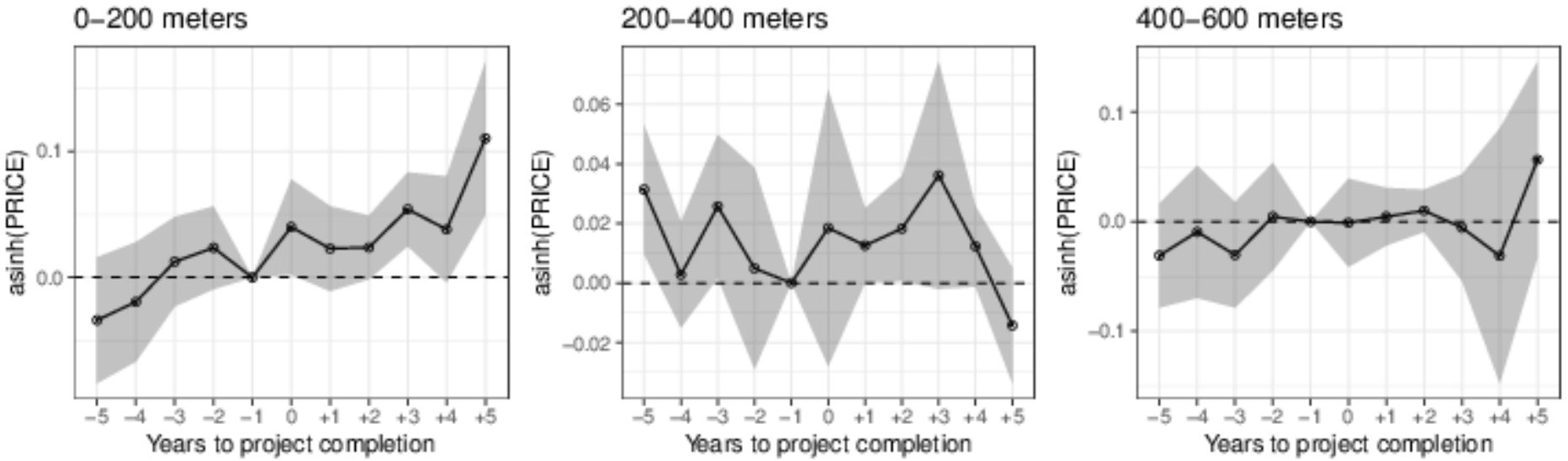
Event Study



Percent increase in price following completion (year = -1)

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Step 2: Gentrification

- Have data on relocation decisions of every Miami-Dade County resident.
- Have matched the data to projects to see if property value price changes induce relocation decisions (not done yet, unfortunately).
- Will then examine changes in health outcomes for residents moving away from projects.

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Conclusions

1. Paper measures climate gentrification and health effects indirectly:
   - Infrastructure projects change property values due protection from climate change An average of 5% increase near projects relative to farther away.
   - Changes in property values drive gentrification
   - Gentrification changes health outcomes.
2. Policy implication: need to combine affordable housing policies with resilience infrastructure.

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Questions

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