Finance & Insurance

A spatial analysis of unequal national flood insurance and mitigation benefits in the Carolinas

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Discriminatory development policies have systematically relegated certain populations to undesirable locations at risk of flooding. As the climate changes, an increased number of properties will no longer be inhabitable and others, especially houses in floodplains and in areas at risk of various types of floods, will suffer damage due to more frequent and significant flooding. Current U.S. federal policy funds flood risk mitigation measures, such as property acquisition, relocation and retrofitting. However, depending on various factors at the sub-county level, these actions can disproportionately benefit high income areas, and high income people in low income areas, and not extend to vulnerable populations. Here we explore patterns that may be of interest specifically to state and county level governments and decision makers, related to potential disproportionate availability and access to government linked programs. This work evaluates NFIP FIMA claims data from 1975-2019 as well as FEMA mitigation efforts from 1989-2018 at the state, county, and census tract levels in North and South Carolina. We find a disproportionate distribution of benefits according to race and economic status in participating counties. As such, majority non-white census tracts in majority white counties receive less benefits. This work grapples with the ethical implications around and responsibility for considering choices in spatial representation and statistical methods in the development of policy.

Designing a Funding Framework for the Impacts of Slow-Onset Climate Change -Insights from Recent Experiences with Coastal Retreat

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Effective management of slow-onset impacts such as coastal erosion, desertification and sea level rise and their often-transformative impacts on communities and countries has remained relatively unexplored in terms of policy and finance responses. Drawing on relevant global experience, this paper investigates recent approaches to planned relocation as one possible response to climate change impacts and considers principles to inform the design of a fair and effective funding system. Relevant principles include minimizing long-term societal costs, pursuing inter-generational equity, integrating funding with broader sustainable development objectives and ensuring a high degree of transparency and accountability for the use of public funds.

Evidence of Climate Gentrification in Florida's Rental Market

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Climate impacts have the potential to advance Climate Gentrification (CG) associated with a geographic transition of populations and financial capital that may lead to economic and cultural destabilization and displacement. Among the various pathways of CG, one pathway suggests that low-risk zones may bear the burden of an influx of population and investment that leads to rent seeking and rapid inflation in housing, commercial and land valuation. Prior research has focused on property values as a proxy for broader measures of destabilization and relative affordability. This research pushes forward with a more resolute examination of the single-family and multi-family rental market and the extent to which socioeconomic vulnerability and physical exposure metrics are manifested in changing market dynamics. Historically, low-to-moderate income (LMI) populations in many areas of what is now urbanized Florida have settled away from the coastlines because of racial and ethnic legacy zoning, as well as amenity capitalization. As the threat of flooding and extreme weather attributable to climate change becomes more tangible within the real estate and insurance markets, areas away from the coast that are often at a higher elevation have been theorized to offer superior long-term investments relative to high-risk areas immediately along the coast and other high-risk flood areas. While prior research has largely focused on for-sale property performance, there has not been any sustained research in the rental market, which is the dominant tenure class for LMI communities. Qualitative and anecdotal evidence suggests that CG may also be coincident with an increase in the number of evictions that further accelerates displacement. Despite the policy relevance of this phenomenon, there is no study that provides experimental and circumstantial evidence at the intersection of rental market dynamics, displacement and physical climate risk. Through the combination of socio-economic data, rental data and risk indices that account for both coastal and riverine flooding, this research has advanced a method that provides evidence that several areas in Florida are and have already been experiencing measures of displacement and rent seeking that may be inferrentially correlated with CG. The underlying method is based on defining quantitative criteria for the detection of areas at-risk of potential CG by combining real estate data from Zillow®; socio-economic vulnerability data from the CDC based off of census data; risk indices from the newly released National Risk Index from FEMA; localized eviction data; and, in some cases, future land use maps promulgated by local authorities.This research focuses on the State of Florida, with a particular focus on water and flooding risks and exposure. The preliminary results suggest existing hot zones of CG throughout Florida in areas such as Broward, Hillsborough and St. John's counties. This research utilizes a case study of the Little River and Little Haiti portion of Miami to explore both a complex set of qualitative and quantitative factors leading to displacement that may have some attribution to social behavior associated with CG. Upon further testing and validation, this method may be applied with a broad scope of geographies and risks from flooding on the East Coast to forest fires on the West Coast. As such, the findings may be highly relevant to policy makers who are seeking to understand future land use patterns and who may seek to balance sustainable urban development ambitions with more localized considerations for housing and cultural preservation.

Insuring our Future: Resilient Buildings and Insurance

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This panel will explore the resiliency journey of a construction management company, an insurer and an insurance broker and their collaborative work to navigate the complex equation of delivering value to collective clients. The discussion will include how climate risk is being evaluated and addressed both in the built environment and in the insurance sector as it relates to the built environment.

The Effects of Sea Level Rise on Property Value and Managed Retreat in Honolulu

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Sea level rise (SLR) associated with climate change will affect assets, their value, and land use decisions in many coastal areas around the world. Recent studies find that exposure to the risk of future SLR is associated with lower current property values in many coastal areas. In this study we apply property transaction data in the City & County of Honolulu (Oʻahu) between 1994 and 2019 to investigate the effect of current and expected SLR exposure on residential property prices. Using detailed state data on properties under various degrees of SLR (including bathtub modeling as well as considering impacts of seasonal wave run-up and exacerbated coastal erosion patterns), we find that exposed properties have already suffered negative impacts to transaction prices at around 10-15%. The estimated economic impacts provide implications to coastal management strategies as a climate change adaptation measure; and how alternative strategies such as managed retreat, managed buyback and coastal armoring compare in terms of relative benefits and costs. Our sample consists of ZTRAX housing transaction records in the coastal area of Oʻahu from Zillow. We identify the properties exposed to sea level rise based on alternative sea level rise exposure indicators from the U.S. National Oceanic and Atmospheric Administration (NOAA) and the Pacific Islands Ocean Observing System (PacIOOS). We apply the methodology in the literature to explore how the transaction prices are associated with SLR exposure by comparing transactions similar in terms of geospatial and housing characteristics, but we also incorporate the presence of coastal armoring (seawalls), onsite disposal system such as cesspool, and the flood zone designation. The discount due to SLR exposure is larger and more statistically significant for more recent transactions. The findings elicit how home buyers view the future and the risk SLR by associating the estimated discounts on the prices of houses subject to SLR risks with the likelihood of various magnitudes of SLR under alternative RCP scenarios. Existing studies indicate the possible misalignment of private and public benefits and costs of seawalls and other forms of shoreline hardening. As SLR proceeds, shoreline hardening will exacerbate the narrowing and disappearance of sandy beach. Some studies indicate negative impacts of a homeowner's seawall on neighboring properties due to accelerated coastal erosion. Without a change in historic practices, hardened shorelines will cause the narrowing and loss of nearly half the beaches on the capital island of Oʻahu by mid-century. How then should emergency seawall approvals be handled or modified in order to mitigate potential damages due to SLR in an efficient way? The empirical testing and simulation of alternative coastal management scenarios would inform us what management reforms may be useful. The coastal areas with different socioeconomic characteristics, as indicated by the Census data, face different exposures and property-value impacts, indicating different distributional impacts of different coastal management strategies. The findings also illustrate how managed retreat programs can be designed to address efficiency and equity among affected communities.