# Abstracts

## Session 1-1: Location Choice and Land Use Regulation
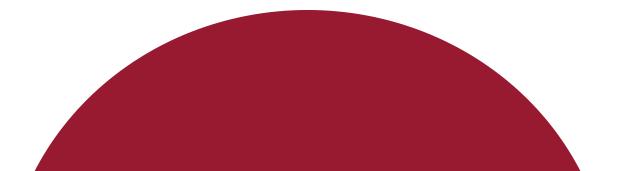### Friday, October 4, 2024

**The Effects of Floodplain Regulation on Housing Markets (Abigail Ostriker, Boston University)** *Discussant: Siqi Zheng, MIT*

We investigate the effects of regulation designed to align privately- and socially-optimal construction in areas at risk of flooding in Florida. Using a spatial regression discontinuity around regulatory boundaries and an event study around the policy's introduction, we document that floodplain regulation reduces construction in high-risk areas and mitigates damages of at-risk homes. Embedding these effects in a model of the housing market, we find the policy reduces damages to the socially-efficient level, but incurs higher costs than a first-best corrective tax. Improved targeting of the existing policy achieves 79% of first-best welfare gains, or $7,041 per newly-constructed house.

**Removing Development Incentives in Risky Areas Promotes Climate Adaptation (Yanjun (Penny) Liao, Resources for the Future)** *Discussant: Chyi Lin Lee, University of New South Wales*

As natural disasters grow in frequency and intensity with climate change, limiting populations and properties in harm's way will be key to adaptation. This study evaluates one approach to discouraging development in risky areas — eliminating public incentives for development, such as infrastructure investments, disaster assistance, and federal flood insurance. Using novel machine learning and matching techniques, we examine the Coastal Barrier Resources System (CBRS), a set of lands where these federal incentives have been removed. We find that the policy leads to lowerdevelopment densities inside designated areas, increases development in neighboring areas, reduces flood damages, and alters local demographics. Our results suggest that the CBRS generates significant savings for the federal government by reducing flood claims in the National Flood Insurance Program, while increasing the property tax base in coastal counties.

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## Session 1-2: Location Choice and Land Use Regulation
### Friday, October 4, 2024

**Cool Cities: The Value of Urban Trees  (Lu Han, University of Wisconsin-Madison)** *Discussant: Bill Wheaton, MIT*

This paper estimates the value of urban trees and shows their ability to moderate temperatures during heatwaves and reduce energy consumption. The empirical strategy exploits an ecological catastrophe—the Emerald Ash Borer infestation in Toronto—to isolate exogenous variation in neighborhood tree canopy changes and finds that a single tree adds 0.45% to property prices within a postal code; the hardest-hit areas lost 7 percentage points in tree canopy cover, resulting in a 7% property price decline. Trees significantly cool urban areas and save energy, but their total amenity value surpasses the value of these ecosystem services, highlighting their cost-effectiveness in combating urban heat island effects.

**Homeward Bound: How Migrants Seek Out Familiar Climates (Charles Taylor, Harvard University)** *Discussant: Vinicios Sant'Anna, MIT*

This paper examines the concept of "climate matching" in migration—the idea that migrants seek out destinations with familiar climates. Focusing on the US, we document that temperature distance between origin and destination predicts the distribution of migrants across counties. This pattern holds for internal and international migration in the past (1850-1940) and today (2011-2019), and is not explained by the spatial correlation of climate or the persistence of ethnic networks. We provide suggestive evidence for two mechanisms driving climate matching: climate-specific skills and climate-as-amenity. Then, we study the implications of climate matching for migrants. Leveraging plausibly exogenous variation in climate mismatch, we document that climate distance reduces life expectancy among immigrants, and increases mortality rates for their US-born children. We calculate an individual-level mortality cost of a 1°C change in climate to be $5,325.

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## Session 2: Economic Impact of Climate Risk

### Friday, October 4, 2024

**Smoked Out: Impact of Wildfire Smoke on the Built Environment (Lyndsey Rolheiser, York University)** *Discussant: Xue Xiao, Virginia Tech*

We investigate how air pollution impacts Commercial Real Estate (CRE) markets by analyzing the effects of far reaching transient wildfire smoke on office buildings. Combining satellite smoke plume data with office rents and lease term length on new contracts, we find that increased exposure to heavy smoke leads to lower rents and shorter lease terms. Building quality is a significant source of heterogeneity in these effect. Building quality (new, high quality) mitigates some of the negative effect on rents associated with wildfire smoke exposure. Conversely, building quality does not mitigate the decline in lease term length that results from smoke exposure. Additionally we find that buildings exposed to lower levels of heavy smoke historically also see significant declines in rent and lease term length with increased heavy smoke exposure. No effect is found for buildings exposed to higher levels of heavy smoke historically. We additionally find suggestive evidence that the negative effect of smoke exposure on worker productivity is a significant channel for our findings. In general, the effect on rents and term length occurs in the short to medium term—within 6 months of exposure. However, given that office lease contracts range from 5 to 10 years, the downward pressure on rent is long-lasting.

**Anything Goes: Pricing Physical Climate Risk (Glen Gostlow, University of Zurich)** Discussant: Nitzan Tzur-Ilan, Federal Reserve Bank of Dallas

Empirical studies provide mixed results on a physical climate risk premium. This paper demonstrates how measurement and estimation methods influence these findings. Once this is considered and using a purely climate-based measure at the facility level that avoids noisy estimates from news or firm disclosure, a consistent premium emerges when risks are combined into a spatially undiversifiable factor. The factor had a monthly discount of -0.19% from 2002 to 2022, with only 34% of its variation priced. The negative premium suggests that investors did not view climate risk as a disaster risk. It was likely undervalued and mispriced.

**Beyond Asset Losses: Estimating the Economic Cost of Floods (Seunghoon Lee, University of Missouri)** *Discussant: Soon Hyeok (Steve) Choi, Rochester Institute of Technology*

While a theoretically consistent cost of floods is a welfare loss, existing estimates are primarily based on asset losses. In this paper, we use variations in high tide flooding (HTF), highly disruptive, yet rarely destructive coastal floods, to estimate the economic cost of floods. We find that on the day of HTF, visits to places such as essential infrastructure and amenities decrease by 5%. Further, one extra day of HTF in the past year lowers rental rates by 0.25% or $51. Using this parameter, we estimate a lower bound annual economic cost of Presidential Disaster Declaration floods at $4 billion.

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## Session 3: Insurance

### Saturday, October 5, 2024

**Flood Risk, Insurance, and Business Relocation (Dayin Zhang, University of Wisconsin-Madison)**
*Discussant: Simon Buechler, Miami University*

Flood risk poses a growing threat to economic activities and real estate in the US. Intuitively, both residential households and commercial businesses should gradually move out of flood zones, especially when those areas face increasing flood risk. However, we find a puzzling pattern that shows businesses in US grew 10% faster in certain central business districts in the past two decades when those districts were designated as flood zones. We build a spatial model that explains thispuzzle: Business misplacement in response to rising flood risk is due to a free riding problem, in which flood insurance is imperfectly enforced while governments provide financial aid to uninsured properties ex post. Our model predicts lower commercial rent after an area becomes a flood zone, matching the price results we obtain from our empirical analysis. Finally, we quantify welfare losses of imperfect flood insurance enforcement using our model.

**How Are Insurance Markets Adapting to Climate Change? Risk Selection and Regulation in the Market for Homeowners Insurance (Judson Boomhower, University of California, San Diego)** *Discussant: Phuong Ho, MIT*

As climate risk escalates, property insurance is critical to reduce the risk exposure of households and firms and to aid recovery when disasters strike. To perform these functions efficiently, insurers need to access high quality information about disaster risk and set prices that accurately reflect the costs of insuring this risk. We use proprietary data on parcel-level wildfire risk, together with insurance premiums derived from insurers' regulatory filings, to investigate how insurance is priced and provided in a large market for homeowners insurance. We document striking variation in insurers' risk pricing strategies. Firms that rely on coarser measures of wildfire risk charge relatively high prices in high-risk market segments – or choose not to serve these areas at all. Empirical results are consistent with a winner's curse, where firms with less granular pricing strategies face higher expected losses. A theoretical model of a market for natural hazard insurance that incorporates both price regulation and asymmetric information across insurers helps rationalize the empirical patterns we document. Our results highlight the underappreciated importance of the winner's curse as a driver of high prices and limited participation in insurance markets for large, hard-to-model risks.

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## Session 4: Infrastructure

Saturday, October 5, 2024

**Does Climate Change Adaptation Matter? Evidence from the City on the Water (Matteo Benetton, University of California, Berkeley)** *Discussant: Bram van der Kroft, MIT*

This paper exploits the unexpected activation of a sea wall built to protect the city of Venice from increasingly high tides to estimate the capitalization of public investment in resilience infrastructure. A difference-in-differences hedonic design shows that properties above the sea wall activation threshold experience a permanent reduction in flood risk and expected damages, which are reflected in higher prices. Combining microdata on both residential and commercial properties, tourist flows, and damage claims, we estimate a lower bound at about €1 billion for capitalized benefits, which accounts for approximately 15% of the costs of the sea wall. Finally, we compute a break-even discount rate of 1.1%, which increases to 2.5% with sea level rise.

**Levees and Levies: Local Financing of Climate Infrastructure Maintenance and Housing Market Dynamics (Yichun Fan, MIT)** *Discussant: Jasdeep Mandia, MIT*

Local financing of climate infrastructure maintenance structurally connects infrastructure quality with housing value. I study how this connection shapes the long-term dynamics of neighborhood housing value and climate risk. Using novel data on the quality of flood protection levees from inspection records and satellite imagery, I find that neighborhoods with low housing value are disproportionately behind levees of maintenance deficiencies, which leads to income inequality in levee failure risk. This cross-sectional disparity is largely driven by differences in local fiscal capacity. Using Bartik-type instruments, I show that local housing value growth driven by exogenous economic forces significantly improves levee maintenance quality through increasing property tax revenue. Over a longer period, the realization of levee failure further reduces housing value by 3-9%, creates negative income sorting, and leads to declines in local budgets, debilitating future maintenance investments. These results highlight the need to consider the feedback dynamics between climate and economic inequality through the financing structure of climate infrastructure maintenance.

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## Session 5: Learning about Climate Risk
### Saturday, October 5, 2024

**Learning about Climate Risks: Evidence from Collateral Appraisals in the US (Dongxiao Niu, MIT)** *Discussant: William McClain, Fannie Mae*

We study the learning process that appraisers use to update their climate risk perceptions in collateral appraisals. We find that in purchase transactions, with the anchoring effect of subject property's contract price, climate risk discount is to some extent reflected in purchase appraisals, regardless of appraisers' own climate risk perception. However, for refinance appraisals, when the anchoring effect no longer exists, appraisers tend to overlook climate risks, resulting in a 2.5-3.4% over-valuation for those refinanced properties with higher flood risks, after controlling for a rich set of location and property attributes. We also find that this overvaluation decreases gradually if appraisers (1) "learn by doing" through increased local appraisal experience with high-risk properties and (2) "learn by experience" by updating their climate risk perceptions through firsthand personal exposure to flooding. This reinforcement learning process significantly varies according to appraisers' personal traits. Additionally, we identify a gap in formal learning opportunities; current training programs are ineffective in facilitating this learning process, likely due to their inadequate emphasis on climate risks.

**Climate Risk and Contract Completeness: Evidence from Corporate Real Estate Leases (Masashi Takahashi, Pennsylvania State University)** *Discussant: Walter Torous, MIT*

Climate risk should drive the design of financial contracts: when contracting parties anticipate potential climate contingencies affecting future asset values, they might want more complete contracts to reduce the uncertainty of future contracting outcomes. Exploiting a novel sample of corporate real estate lease contracts combined with quasi-experimental hurricane incidents, this paper demonstrates how climate risk exposure enhances contract completeness. The key finding is that a recent hurricane experience at a tenant-side corporate headquarters leads to a 20% increase in the number of clauses related to climate contingencies, such as insurance or Force Majeure, in their contracts for subsequent years. Intriguingly, such experiences catalyze a 4% increase in the addition of clauses on topics beyond climate-related contingencies, thus enriching the contract's overall completeness. The findings imply that cognition plays a role in incorporating climate risk into financial contract design.