Sust Global.

Populous: A Multimodal Geospatial AI Model for Understanding the Climate-Driven Insurance Crisis in the U.S.

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1. Motivation

Climate Risks Are Reshaping the U.S. Insurance Market

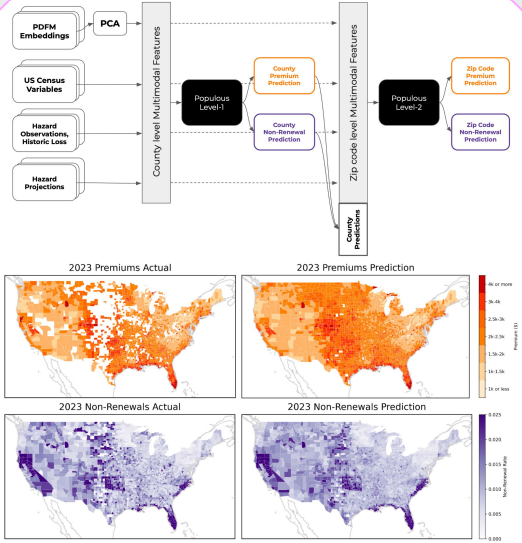
Widespread non-renewals, rising premiums, and insurance retreat are destabilizing housing markets—especially in high-risk regions like Florida and California.

2. Modeling Framework

Multimodal AI for Insurance Risk Modeling

We predict insurance premiums and non-renewals using a two-stage pipeline:

1. County-level prediction from multimodal inputs
2. Zipcode-level super-resolution for fine-scale insights



3. Model Performance

High Accuracy in Predicting Market Outcomes

- County level: 93% top-2 accuracy (premiums), 61% R^2 (non-renewals)
- Zipcode level (California): 90% top-2 accuracy, 50% R^2

4. Key Insights

Climate Hazards Drive Non-Renewals

Future and past climate risk—especially cyclones and wildfires—are among the top predictors of insurance market behavior.

5. Why it Matters

Populous provides high-resolution, explainable predictions of insurance risk—supporting smarter decisions by investors, insurers,, and regulators. As climate pressures grow, Populous ensures risk is priced fairly and interventions target the communities that need them most.