

Flood Risk and Residential Property Values:

Evidence from Parcel-Level Analysis in St. Louis

As climate change intensifies urban flooding, understanding how flood risk is reflected in housing prices is increasingly important for both real estate research and urban policy. A large body of literature shows that flood risk is capitalized into residential property values through hedonic pricing. Early studies find that properties in FEMA-designated floodplains sell at discounts of about 4 to 12 percent. For example, Bin and Polasky (2004) show that floodplain homes experience significant price reductions, which more than double after major flood events. Later work suggests that these effects may weaken over time as perceived risk fades.

Recent research emphasizes the need to separate flood risk from correlated spatial amenities, such as waterfront amenities. Failure to control for such amenities can bias estimates of flood risk. Other studies highlight that heterogeneous or incomplete risk perceptions can lead to inconsistent pricing of flood risk. Advances in GIS-based analysis further demonstrate the value of parcel-level data for capturing localized environmental risks that are not visible in aggregated data. Building on this literature, this study examines the impact of flood risk on residential property values in St. Louis using a GIS-based parcel framework. The dataset combines FEMA floodplain maps with transaction-level housing data, covering December 1996 through June 2025. The sample includes approximately 132,000 residential parcels, of which 529 are located in flood hazard zones. In St. Louis, floodplains are narrow and concentrated along the Mississippi River, making parcel-level analysis especially important for identifying localized exposure.

Prior studies suggest that floodplain properties may benefit from unobserved amenities such as scenic views or recreational access, which can offset risk and complicate estimation. However, the St. Louis setting differs from coastal markets. Flood-prone areas are largely adjacent to industrial and infrastructural land uses rather than desirable waterfront developments. As a result, proximity to the Mississippi River does not provide strong positive amenities, reducing the risk of amenity–risk confounding.

By combining parcel-level GIS data with census tract and year fixed effects, the analysis isolates flood risk from within-neighborhood variation. This allows for a cleaner estimate of the effect of flood exposure on housing prices. The results show that properties in flood zones sell for approximately 20 percent less than comparable properties, indicating a substantial economic penalty associated with flood risk.

Control variables behave as expected: prices increase with living space and number of units, decrease with age, and rise with proximity to parks. When distance to the Mississippi River is included, the flood-risk discount remains stable, while greater distance from the river is associated with higher prices. This suggests that proximity to the river functions as a net disamenity, likely reflecting industrial activity, perceived risk, and other negative externalities.

Overall, the findings extend prior research by focusing on an inland urban context and demonstrate the value of GIS-based parcel analysis in isolating environmental risks. The larger estimated discount, compared to earlier studies, may reflect the absence of offsetting waterfront amenities in St. Louis. These results provide important implications for urban planning, flood mitigation, and climate adaptation policies.