Hixon Center for
Urban Sustainability

FACT SHEET

Historical Redlining Impacts Flood and Heat Risks Today

Healthy City | **Climate Ready City**

Climate Issue: Flood and Heat Risks

- Climate change increases the frequency, duration, and intensity of flooding and heatwaves
- These events disproportionately affect marginalized communities that are more exposed to these stressors
- People's exposure is highly dependent on where they live
- These disparities are a result of historical decisions made for urban development, such as "redlining."

The Origins of Redlining

"Redlining" refers to the practice of systematically denying or restricting access to mortgage lending to neighborhoods based on race, ethnicity, and other factors.

In the 1930s, the United States Home Owners' Loan Corporation (HOLC) made maps assessing perceived mortgage lending risk. Maps classified neighborhoods from A — green, or "least risky" — to D — red, or "most risky." This led to the term "redlining."

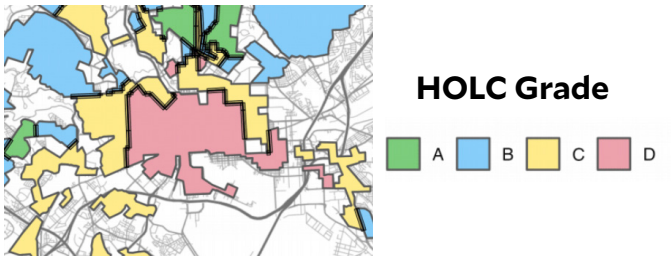

Fig 1. HOLC map of Baltimore, Maryland, with HOLC polygon grades.

Consequences of Redlining

Although redlining was formally outlawed in 1968, the consequences persist today:

- The science shows that across 202 US cities, once-redlined neighborhoods are at higher risk of flooding and heat exposure
- Lower-graded homes have a 5.5% higher flood risk
- Lower-graded homes have a slightly higher heat risk, which incorporates the impacts of both temperature and humidity
- Homes within a block of each other can have different climate risks
- Studying risks at the parcel level can reveal how resources are unequally distributed.

Lower-Graded Neighborhoods Saw Less Investment in "Environmental Capital"

Research shows that the "environmental capital" of a given area is a helpful proxy to measure climate risks. Lower-graded neighborhoods were found to lack natural benefits, like:

- Reduced tree canopy and street-level vegetation for shade and cooling
- Lower ground surface perviousness for flood prevention
- Lower foundations in building construction, which can lead to greater damage from extreme weather.

Findings confirmed the persistent influence of historical practices on present-day vulnerability to climate risks.

IN A NUTSHELL

- Neighborhoods historically marked as "less desirable" face disproportionately higher risks of flooding and extreme heat
- These areas have reduced tree canopy, lower ground surface permeability, and lower construction foundation heights
- Understanding the consequences of historical urban development decisions can shape equitable investments in vulnerable neighborhoods.

WHAT CAN YOUR CITY DO?

ASSESS the environmental capital of neighborhoods

INVEST in trees, green spaces, and proper drainage systems to reduce climate risks

PROVIDE direct support to communities with histories of disinvestment

UPHOLD federal policies that guide equitable lending practices and community development.

To find out more information on this fact sheet, contact **Professor Arianna Salazar-Miranda** at **arianna.salazarmiranda@yale.edu,** or visit the website for the **Livabable City Lab** at **https://livablecitylab.yale.edu**. Fact sheet based off Salazar-Miranda, A., Conzelmann, C., Phan, T., & Hoffman, J. (2024). Long-term effects of redlining on climate risk exposure. Nature Cities, 1(6), 436–444. https://doi.org/10.1038/s44284-024-00076-y.