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More air pollution present in areas with historical redlining

UW News staff

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Despite dramatic improvements in air quality over the past 50 years, people of color at every income level in the United States are exposed to higher-than-average levels of air pollution. While this disparity has been widely studied, the links between today's air pollution disparities and historic patterns of racially segregated planning are still being uncovered.

Researchers at the UW and UC Berkeley have found that housing discrimination practices dating from the 1930s still drive air pollution disparities in hundreds of American cities today. *Sarah McQuate/University of Washington*

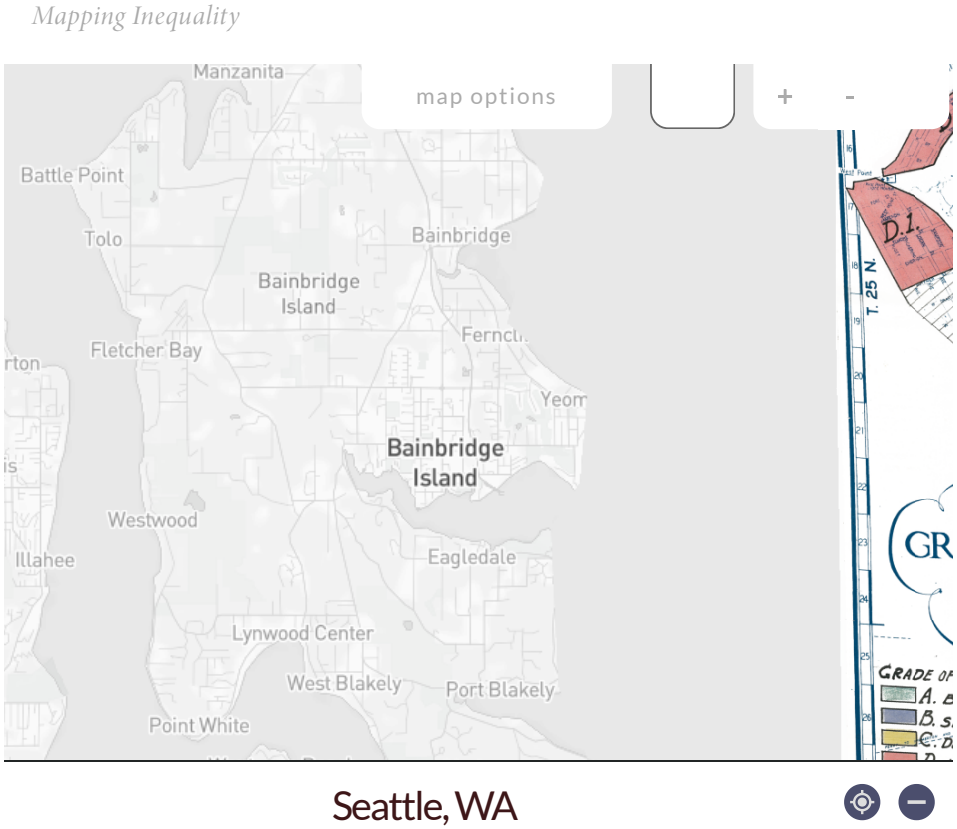
Now a new study from a team of researchers at UC Berkeley and the University of Washington has found that housing discrimination practices dating from the 1930s still drive air pollution disparities in hundreds of American cities today. In this study — the first to do a national-level analysis of modern urban air pollution and historical redlining — the team examined more than 200 cities and found a strong correlation between present-day air pollution levels and historical patterns of redlining.

The researchers published their findings March 9 in Environmental Science & Technology Letters.

"Racism from the 1930s, and racist actions by people who are no longer alive, are still influencing inequality in air pollution exposure today," said co-author Julian Marshall, a UW professor of civil and environmental engineering. "The problems underlying environmental inequality by race are larger than any one city or political administration. We need solutions that match the scale of the problem."

The term "redlining" describes a widespread federally backed discriminatory mortgage appraisal practice in the 1930s. This process color-coded city areas red if they included high concentrations of Black, Asian, immigrant or working-class residents, deeming these areas hazardous and excessively

risky for investment. Redlining blocked access to favorable lending and other services. Historically redlined areas have been cumulatively affected by a low prevalence of home ownership, uneven economic development, displacement of residents, community disintegration and lack of access to education and economic opportunities.



A redlining map of Seattle. Click on a neighborhood or a grade for more details. ***Credit: Mapping Inequality***

The researchers compared year-2010 levels of two regulated air pollutants — nitrogen dioxide (NO_2; a short-lived gas emitted by traffic, industry and other sources), and fine particulate matter ($PM_{2.5}$; longer-lived, tiny particles found in dust, soot, smoke and other emissions or formed in the atmosphere) — to redlining maps in 202 U.S. cities.

In these cities, redlined areas consistently had higher levels of pollution today than areas that received favorable treatment. In fact, air pollution disparities associated with redlining status were even larger than those associated with race and ethnicity.

The study highlights the "distinct inequities that affect people in all neighborhoods, regardless of redlining grade," said lead author Haley Lane, a doctoral student in civil and environmental engineering at UC Berkeley. "It also emphasized the importance of identifying and improving conditions in those neighborhoods which have been systematically isolated from financial investment through practices like redlining while being subjected to increased environmental exposures for decades."

The long-lasting implications of historical segregation on present-day disparities are striking, according to the researchers.

The team also found racial disparities within redlined neighborhoods, suggesting that housing discrimination is one of many factors propelling environmental racism. In other words, white people who happen to live in redlined neighborhoods still have lower air pollution exposure than people of color in the same community. That trend held across non-redlined and redlined neighborhoods alike, the researchers said.

"This study underscores how the past is still very much present when it comes to air pollution disparities," said senior author Joshua Apte, assistant professor in the Department of Civil & Environmental Engineering and the School of Public Health at UC Berkeley. "Redlining is a good predictor of air pollution disparities but it's only one of the things that drive the racial and ethnic disparities in air pollution. It's not the only source of disparity that we need to be worried about."

See a related story in The Washington Post.

The research goes "a long way toward highlighting the lasting consequences of structural racism on community health," said co-author Rachel Morello-Frosch, a professor of Public Health and Environmental Science, Policy and Management at UC Berkeley and co-author of the study. "These results can point the way toward targeted approaches for regulating emission sources and reducing exposures, as well as longer-term strategies to address discriminatory land-use decision-making that adversely impacts communities of color."

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For more information, contact Marshall at jdmarsh@uw.edu and Apte at jsapte@berkeley.edu.

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