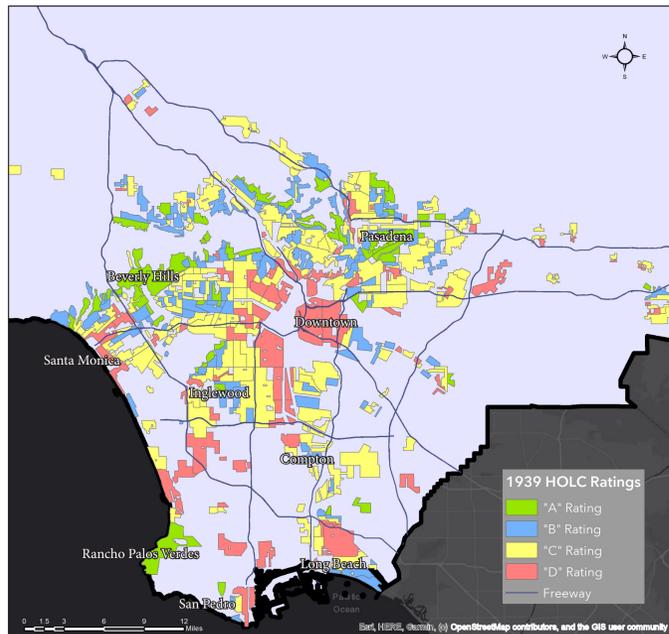


LASTING EFFECTS: REDLINING IN LOS ANGELES COUNTY

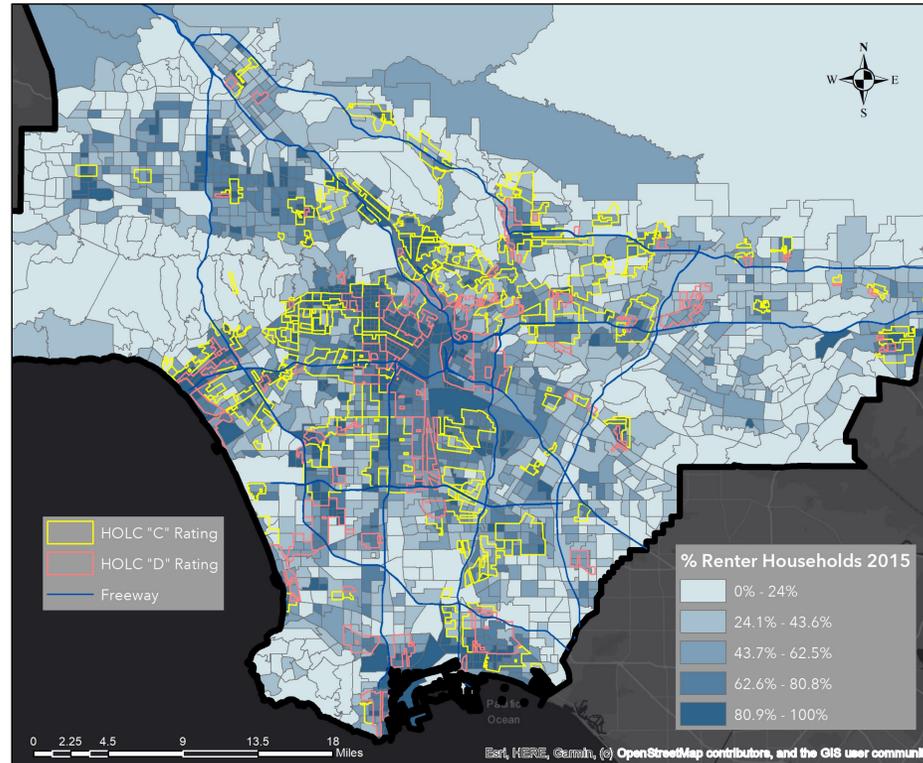
BACKGROUND

Historic redlining in the United States was a systematic practice of denying financial services to low-income and nonwhite communities which ultimately enabled racial segregation. During the Great Depression, President Roosevelt founded the Federal Housing Agency (FHA) and the Home Owner's Loan Corporation (HOLC) with the intention to enact more liberal loaning policies to increase national homeownership. The HOLC collected socioeconomic data from cities across the country, including 239 cities within Los Angeles County. This data was then used to rank neighborhoods based on the profitability of the area for both homeowners and banks. This ranking system classified neighborhoods from "A" to "D", representing "best", "desirable", "declining", and "hazardous". Communities with higher rankings were granted more liberal loaning, while loans were rarely given to homes within "C" and "D" neighborhoods. "A" rankings were exclusively given to high-income white neighborhoods, "B" to working-class white areas, "C" to low-income white and working-class communities of color, and "D" described low-income communities.



METHODS

To analyze the current socioeconomic characteristics of each of the four rankings, I first identified the ranked areas with the corresponding colors to create a simple reference map which includes major cities within the county (see above). I chose median income and percent of renter households to represent the distribution of wealth in Los Angeles. I also chose to visualize PM2.5 exposure, which is a particulate matter and type of air pollution that causes asthma, lung and heart diseases, and death. It is produced by cars and other vehicles and is also disproportionately affects communities of color. I used kernel density to represent where the pollution is greatest. The last factor I chose to analyze is the percentage of non-Hispanic white individuals per census tract to see how the HOLC rankings have determined LA's distribution of race and ethnicity. All of the maps, with the exception of the PM2.5 density, were visualized into five distinct shades based on natural breaks (Jenks) since it is good at mapping data that is not evenly distributed. After visualizing these factors per census tract, I added the HOLC ranking outlines to see any trends or similarities. Then, I converted the key attribute's layer into a raster so I could analyze zonal statistics for each HOLC ranking. These results represent the absolute minimums and maximums of each area, as well as the average mean and the mean's standard deviation.



Percent of Renter Households 2015

HOLC	Minimum	Maximum	Mean	Standard Dev.
A	4.31%	85.11%	28.8%	0.17
B	0%	99.47%	47.42%	0.18
C	5.99%	100%	61.86%	0.18
D	0%	100%	63.51%	0.18

RESULTS + CONCLUSIONS

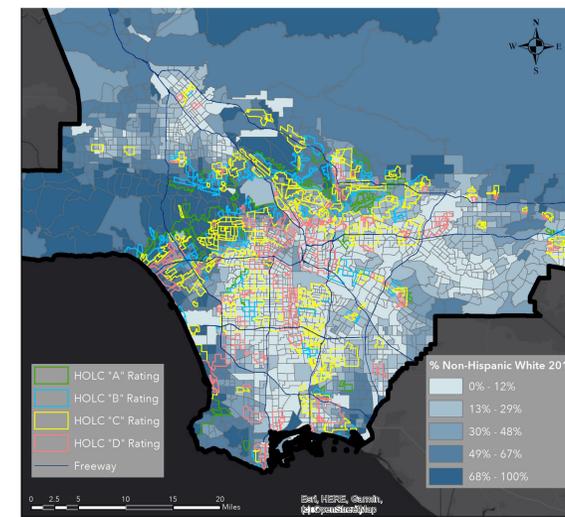
The HOLC's ranking system is where redlining in the United States originated from and has had long-lasting, dramatic effects. People living in "C" or "D" areas during this time were not able to receive loans to purchase homes or for home improvement, like the generous loaning "A" neighborhoods received, and therefore many people of color in these "C" and "D" areas are still renters. Homeownership is closely related to power, as it is a tool for building wealth, and many have been excluded from being able to do so. This map is crucial context to understand and explain Los Angeles County's striking spatial inequities. This research project demonstrates the power that the historic 1939 HOLC Los Angeles map has had. Visually, it can be seen on all four maps that the "C" and "D" areas have a higher percentage of renter households, higher exposure to PM2.5 air pollution and lower average median income, while "A" and "B" areas hold a higher percentage of the non-Hispanic white population. These results can also be seen quantitatively in the zonal statistics charts. It's shocking to see how closely some of the HOLC map can still be seen today with certain characteristics, especially air pollution and percent of renter's households.

PROJECTION + SOURCES

Projection: NAD 1983 2011 StatePlane California I FIPS 0401

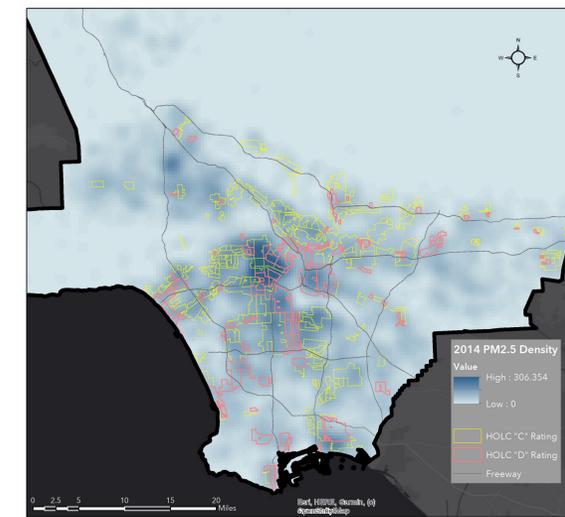
Sources: Los Angeles County GIS Data Portal, USC Pirce Center for Social Innovation, UCLA Urban Displacement Project, Union of Concerned Scientists, Mapping Inequality

Reference: Tijerina, Jamie. "The Legacy of Redlining in Los Angeles: Disinvestment, Injustice, and Inefficiency Finding a Path Forward in 2019 and Beyond," March 16, 2019. https://clkrep.lacity.org/onlinedocs/2019/19-0600_misc_5-6-19.pdf.



Percent of Non-Hispanic White People 2015

HOLC	Minimum	Maximum	Mean	Standard Dev.
A	1.41%	92%	54.68%	0.26
B	0%	92%	45.56%	0.27
C	0%	91.4%	31.31%	0.26
D	0%	87.83%	21.84%	0.22



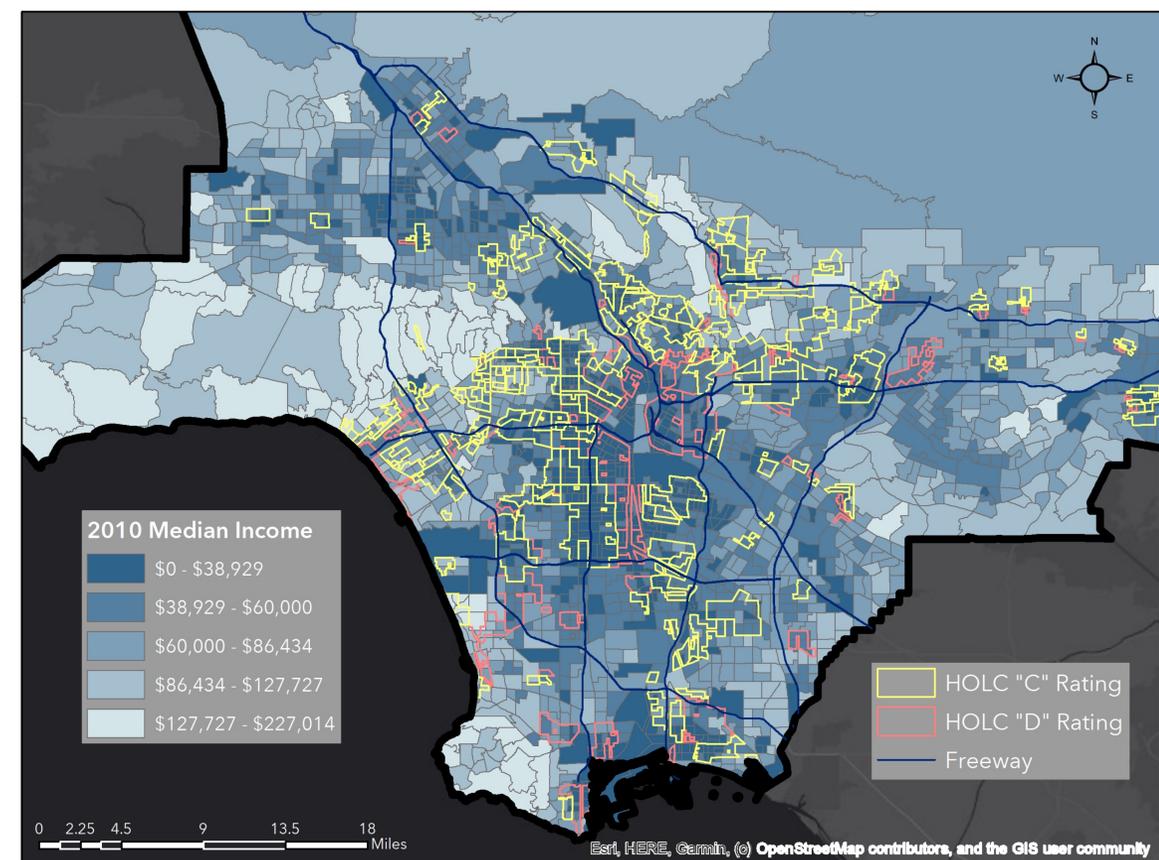
PM2.5 Exposure (average ppm/sq mile) 2014

HOLC	Minimum	Maximum	Mean	Standard Dev.
A	0.59	10.2	3.5	1.74
B	0.83	14.12	4.59	2.09
C	0.85	18.9	5.36	3.19
D	1.5	17.94	5.48	2.99

"If a neighborhood is to retain stability it is necessary that properties shall continued to be occupied by the **same social and racial classes**. A change in social or racial occupancy contributes to the instability and **decline in property values**" - FHA Underwriting Manual, 1936

Median Income 2010

HOLC	Minimum	Maximum	Mean	Standard Dev.
A	\$47,639	\$227,014	\$114,400.52	40163.56
B	\$0	\$227,014	\$78,786.20	33015.36
C	\$10,671	\$184,800	\$57,874.79	22923.51
D	\$0	\$146,226	\$50,803.64	20004.35



2010 Median Income

\$0 - \$38,929
\$38,929 - \$60,000
\$60,000 - \$86,434
\$86,434 - \$127,727
\$127,727 - \$227,014

Grace Schumaker
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Introduction to GIS

A special thanks to Professor Shakespeare and Brian Froeb for all of the support and guidance.

