

URBAN HEAT ISLAND ANALYSIS

BROWARD COUNTY, FLORIDA | 2020



THE DANGER OF EXTREME HEAT

Extreme heat – exacerbated by the “urban heat island” effect and climate change is the deadliest weather or climate related hazard in the U.S. Urban heat islands occur in areas with a high percentage of impervious surface area and little green space where temperatures can significantly exceed the regional average. These heat islands are found in dense urban areas with a limited greenspace and large amounts of asphalt, concrete, and other impervious surfaces.



Global temperatures have risen approximately 1°C over the past century.



Urban areas have risen an additional 1-3°C due to the urban heat island effect.

WITH A NATURE-BASED SOLUTION

Urban heat islands are a critical public health issue – with a nature based solution. Urban trees and greenspace can effectively mitigate urban heat islands, while provide numerous benefits such as air quality improvement and stormwater capture.²



Urban vegetation offers shade and evapotranspiration, which can lower peak summer temperatures 2-9°F.^{3,4}



Urban trees provide heat reduction, which supports public health by reducing heat stress and contributes to reduced household energy costs.

ANALYSIS FOR BROWARD COUNTY

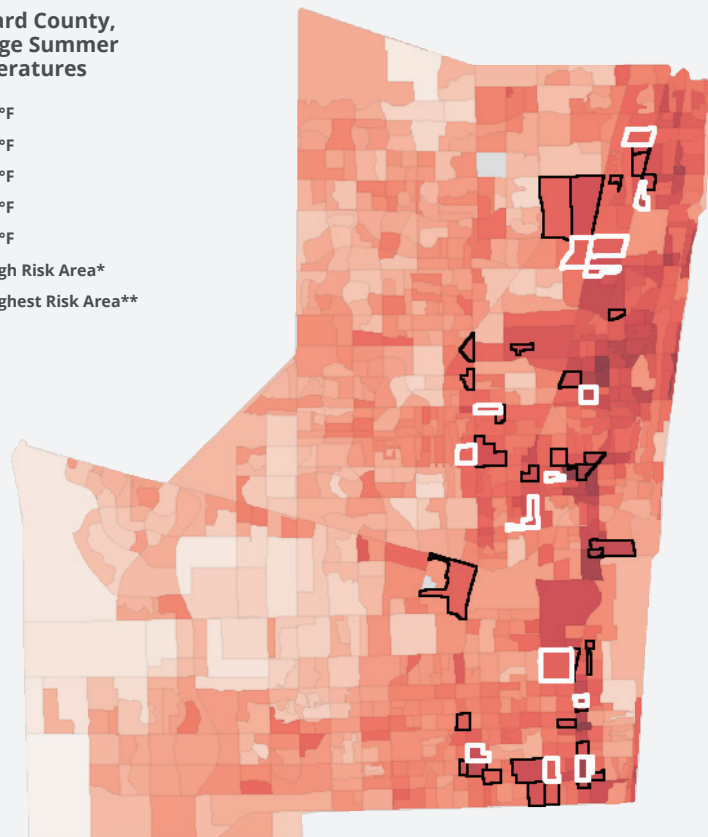
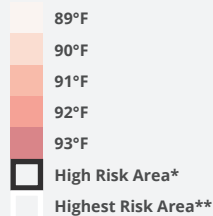
In Broward County, our analysis found that urban heat islands increase maximum temperatures by as much as **5°F** above the local baseline. **90,000 people** live in neighborhoods where the urban heat islands increase temperatures by 2°F or more and where average per capita incomes are less than 200% the federal poverty level (outlined in black in map, below). **33,000 people** live in areas that meet the above criteria and have a high percentage of population in high risk age groups (under age 14 or over age 65). Every additional degree carries significant public health costs.¹

In the Broward County's most severe urban heat islands, all-cause mortality rates are estimated to increase by **4.7% (2.4% - 7%)** when baseline temperatures exceed 90°. Broward County experience 74 days above 88°F per year, on average. Our model estimates that **13 – 44 lives are lost** in the county each year due to urban heat islands effect.

The public health burden of urban heat islands is disproportionately levied on the lowest income households. In Broward County there is a strong correlation between household income and urban heat islands (Table 1, reverse side).

Without intervention, Broward County's heat island impacts will grow significantly in a changing climate. Number of days above the 88°F threshold has increased by 36% since 2000 (Table 2, reverse side). On the current trajectory Broward County will experience 144 days above the temperature threshold by 2050, and 223 days above the threshold by 2100.

Broward County, Average Summer Temperatures



*High Risk Area is defined as neighborhoods where the urban heat islands increase temperatures by 2°F or more and where average per capita incomes are less than 200% the federal poverty level.

**Highest Risk Area is defined as neighborhoods where High Risk Area criteria is met as well as a high percentage of population in high risk age groups (under age 14 or over age 65).

IN FLORIDA THERE IS A STRONG CORRELATION BETWEEN SUMMER HEAT AND NEGATIVE HEALTH OUTCOMES.



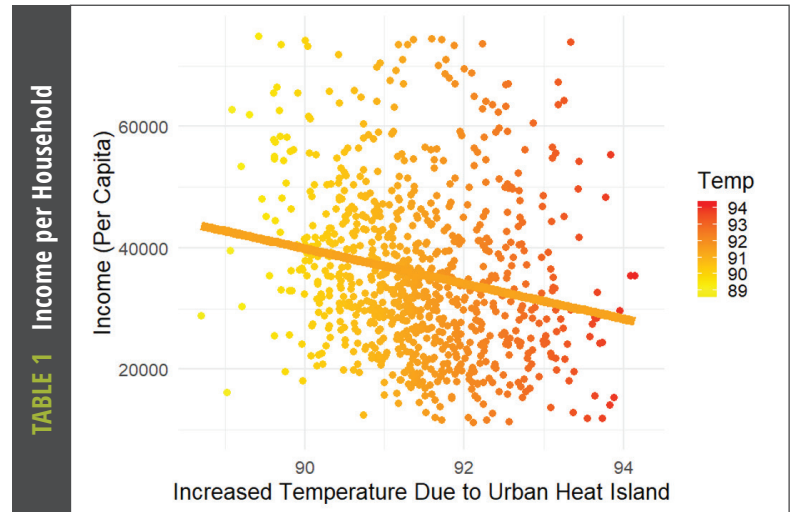
TEMPERATURES ABOVE 88°F SIGNIFICANTLY INCREASE THE RISK OF CARDIOVASCULAR DISEASES, RESPIRATORY ILLNESSES, AND HEAT STROKE.⁵

WHAT ARE URBAN HEAT ISLANDS?

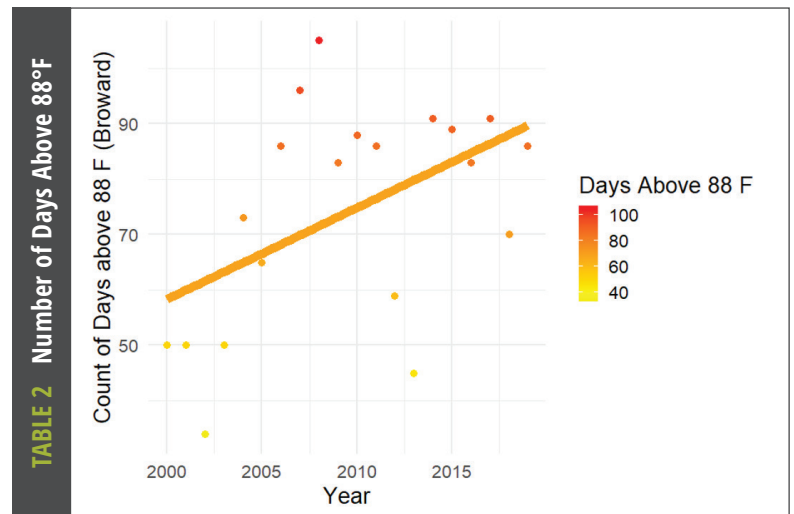
Dense urban areas absorb and trap heat due to impervious surfaces — like pavement and rooftops — that absorb solar radiation, buildings that block wind flow, pollution and smog that trap solar radiation, and low levels of vegetation and tree cover that restrict evapotranspiration — which functions as natural air conditioning.

Urban heat islands have significant impacts on human health and will have an even greater impact over the next century as the climate warms and populations urbanize.

THE COST OF PUBLIC HEALTH CAUSES THE GREATEST ECONOMIC BURDEN ON LOW-INCOME COMMUNITIES.



TEMPERATURES IN BROWARD COUNTY HAVE INCREASED 36% IN THE LAST 20 YEARS.



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