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Geog 460
Term Project
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(Link to map animation HERE)

Does Pittsburgh, PA See an Increase in Simple Assault Crimes with Warmer Weather

The purpose of this study was to determine any correlation between warmer weather and simple assault crimes in Pittsburgh, Pennsylvania. With warmer weather people spend more time outdoors and tempers can be shorter due to the heat. I hypothesized that this would lead to increased numbers of reported simple assaults in the city.

I began with data from 2008 containing all reported offenses in Pittsburgh in that year. From that data, I selected only the records for reports of simple assault, then grouped those by month. What I ended up with was the total number of simple assaults for each of the twelve months of the year, and their locations within the city. With that information, I was able to determine hot spots for simple assaults by using kernel density smoothing and a radius of 1500 feet and a cell size of 50 feet. This produced one map for each month showing concentrations of simple assaults throughout the city.

The data was classified using ¼ Standard Deviation and set into 16 classes to show clear steps between the colors on the map. Whole numbers were used to label the classes to facilitate understanding of the legend in the map. I symbolized the data the same way for each map, with a blue-yellow-red color ramp. Blue represents low numbers of simple assault reports and red indicates high numbers. To make the street grid visible in the maps I removed all color from the areas with one for fewer simple assault reports in a month. Normally, having no color in an area means there was no data, but I felt that it improved map legibility significantly enough that it was worth breaking that convention.

The twelve maps created from the simple assault data show some fluctuation of hot spots from month

to month but overall are fairly uniform and do not show any correlation between warmer weather and

greater incidence of simple assault. The highest densities are loosely oriented around an arc that

stretches from the southern part of the city, through the central business district, to the northeastern

area. The general shape of this arc exists in each map, but is illustrated best by the map for August, as

shown in *Figure 1*. There is another consistent hot spot just north, across the Allegheny River, of the

central business district that appears in varying sizes each month. The concentration of hot spots within

those four areas (3 that make up the arc, and one to the north) varies somewhat month to month but,

overall, the maps indicate that those are consistent trouble spots.
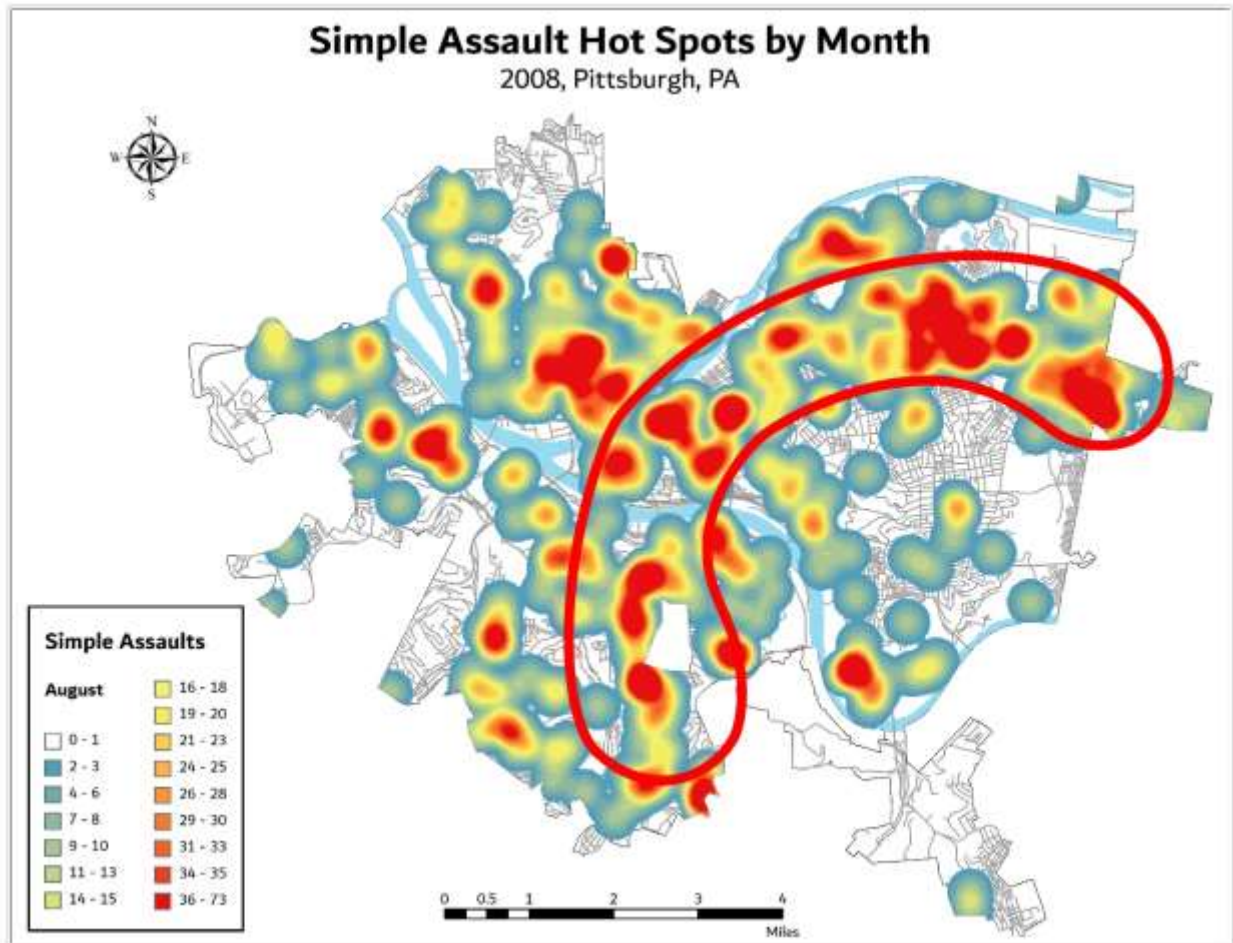

Figure 1 Simple assault hot spots form a general arc through the city of Pittsburgh.

The northeastern part of Pittsburgh is the most consistent, often merging several smaller hot spots into

a larger one, most notably in July, August, and September as shown in *Figure 2*. This might seem to

indicate that warmer weather does, in fact, correlate with more simple assault crimes, but this pattern is

found only in one part of the city and is not clear enough for confidence that the two are related.

Further mapping using a smaller search radius may refine that pattern.

Figure 2 Hot spots in the northeastern section of Pittsburgh grow into a single large hot spot in certain months.

Other areas fluctuate more widely. In the northern and northwestern parts of the city simple

assault reports ebb in December and February, and they appear to drop slightly in November as well.

December and February show the fewest hot spots overall, especially in the southern area. The

southern and southeastern sections of Pittsburgh show the largest drop-off of simple assaults in all

months, as compared to more central areas. Studying the density and demographics of these areas

might prove useful to discover why they are different.

In mapping this data, I had expected to see noticeable increases in the busiest downtown and

dense residential areas during warmer weather, but I cannot say definitively that such a pattern exists.

December and February do clearly have fewer reports of simple assault, but there is insufficient visual

difference between March and August, for example, in where and how large the hot spots are (*Figure 3*).

I believe there is enough of a difference, however, between the warmest and coldest months to not

completely disprove this hypothesis. Visualizing the data with a smaller radius and with greater

frequency—perhaps weekly or daily—would likely result in a clearer understanding of any relationship

between simple assault and temperature. It would also probably prove useful to compare the numbers

of simple assaults each month in a bar graph to determine if the overall numbers of these crimes are
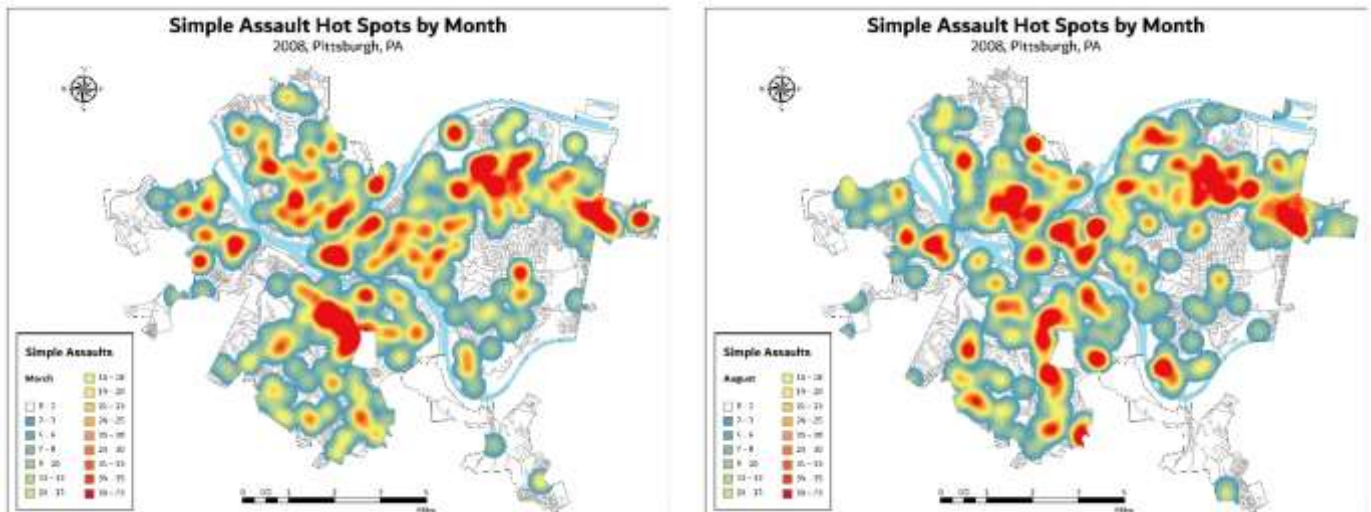
changing significantly.

Figure 3 Simple assault hot spots compared between March and August.

If such a relationship could be identified it would be useful to law enforcement. By understanding when and where these types of crimes are likely to occur, police departments could deploy personnel to most effectively deter simple assaults. Police could prioritize common gathering spots within the city for patrols, since the mere presence of officers is likely to interrupt people from overreacting and committing these crimes. Patrols might be increased in hot spot areas at the hottest times of the day or during heat waves.