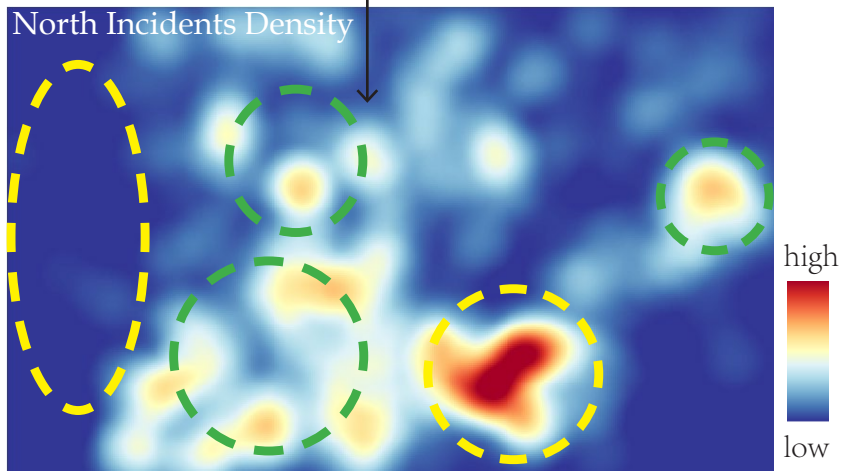
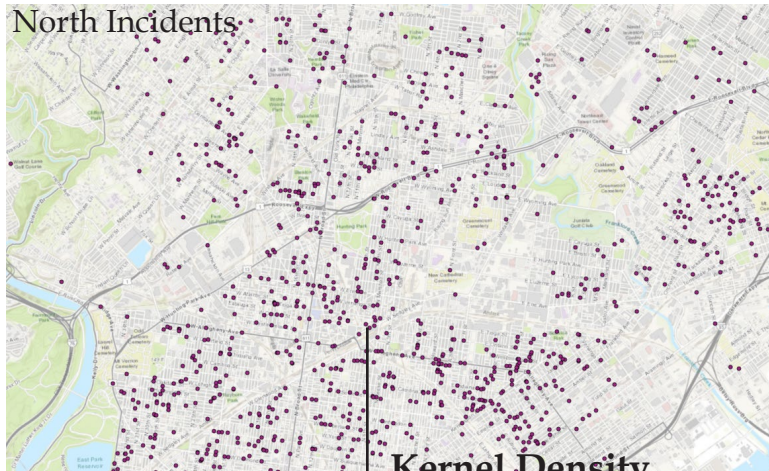


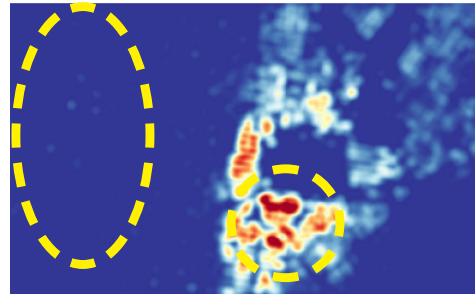
THE LIKELIHOOD OF FUTURE GUN VIOLENCE



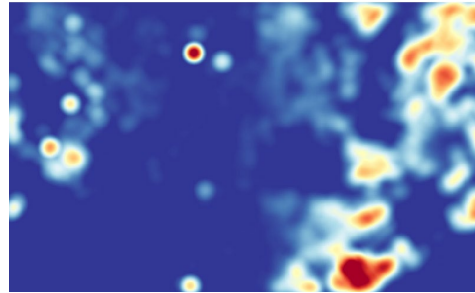
First, I performed **Kernel Density** calculation on the existing northern incidents point to find out its high density area. Then, I applied **Kernel Density** and **IDW** tools on the North Population data and North Condition data respectively. By comparing the features' density layers with the incidents' density layer (clusters of high values and low values), we can find out which are the suitable features for the following calculation. (marked in red)

North Populations--Kernel

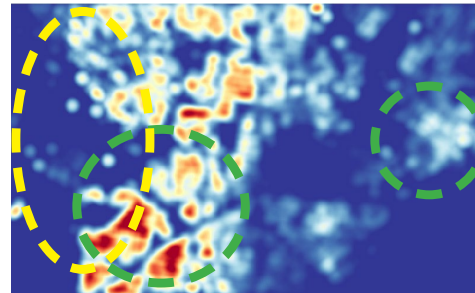
Hispanic Population



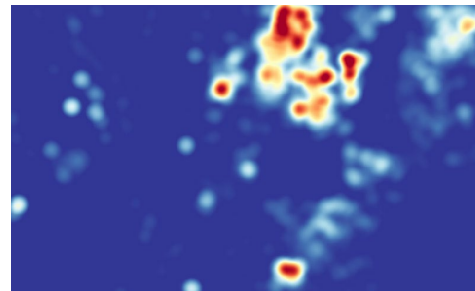
Non-hispanic White population



Non-hispanic Black population

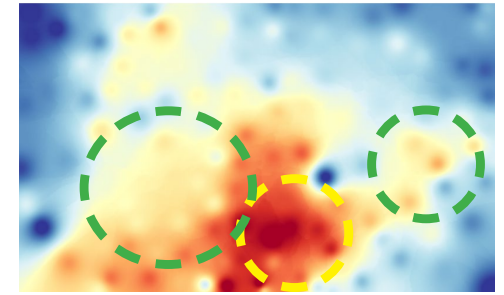


Non-hispanic Asian population

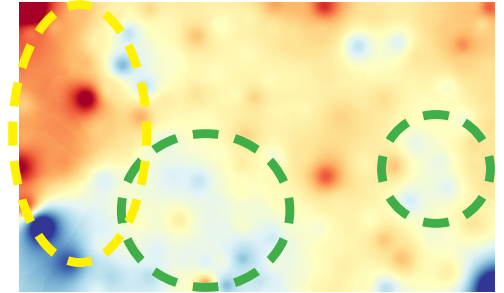


North Conditions--IDW

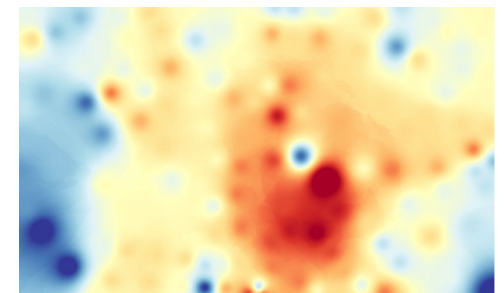
% of population living below poverty



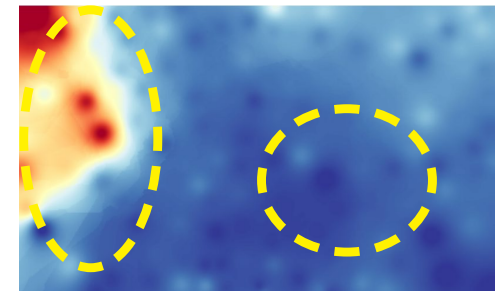
Median Monthly Rent in Dollars



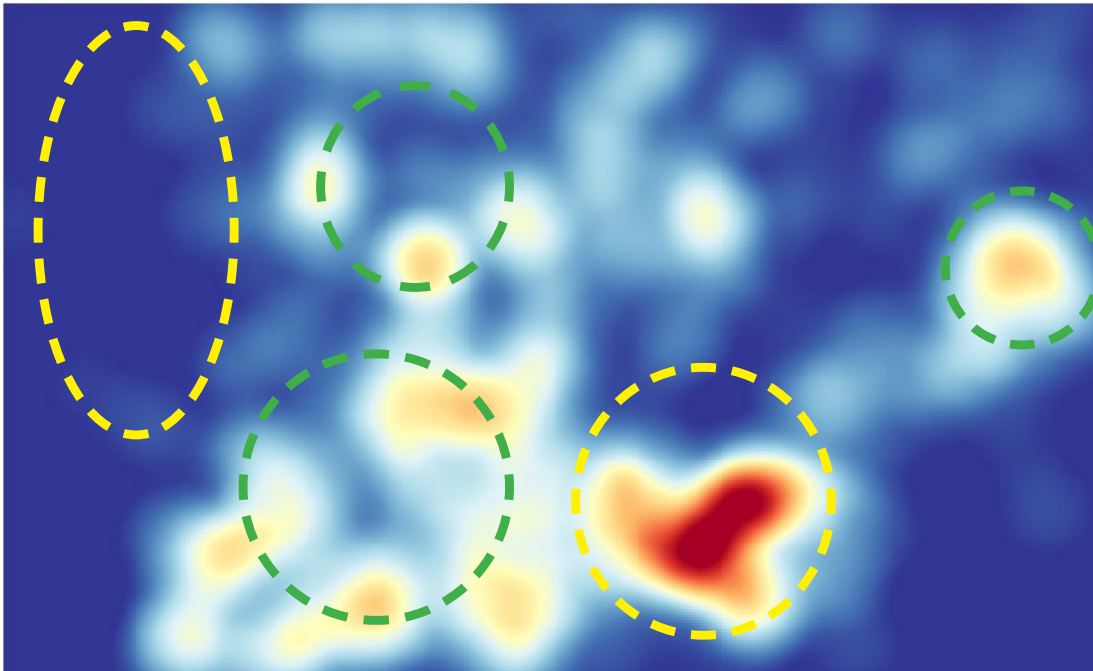
% of population below the age of 5 yrs



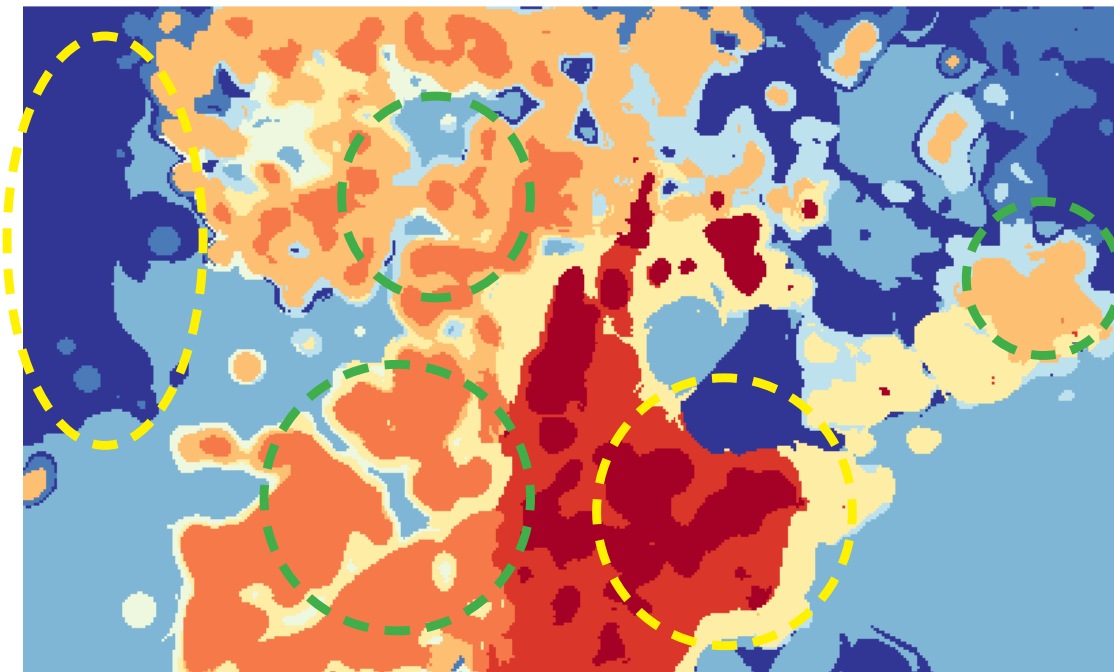
% of population in college for at least 2 yrs



Kernel Density of North Incidents



Predicted Kernel Density of North Incidents



Overlay Layers to filter the Features

Through the previous visual comparison step, the following FEATURES are filtered out for overlaying to compare the predictions with actual results.

1. Hispanic Population
2. Non-hispanic Black Population
3. Percent of population living in poverty
4. Median monthly rent in dollars
5. Percent of population in college for at least 2 years.

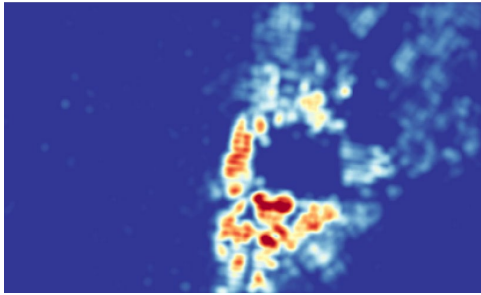
Note:As the 4&5 shows they have high values associated to the areas consisting of low gun crimes, these two features' layers need to be inverted for further calculation.

The specific steps are detailed in the next few pages.

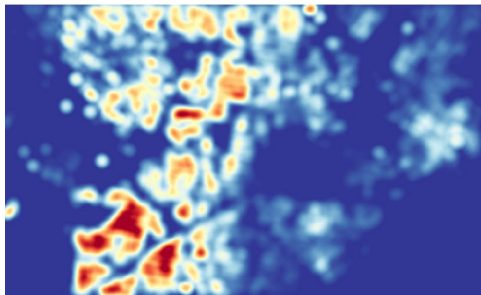
After comparing the predicted crime density map calculated from the five features with the kernel density map calculated from the actual incident points, it can be found that their main features match relatively well, proving that these five features are suitable for subsequent calculations.

North Part

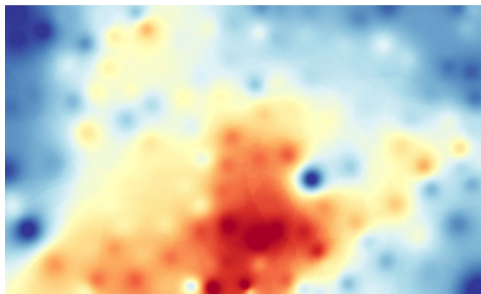
Hispanic Population



Non-hispanic Black population



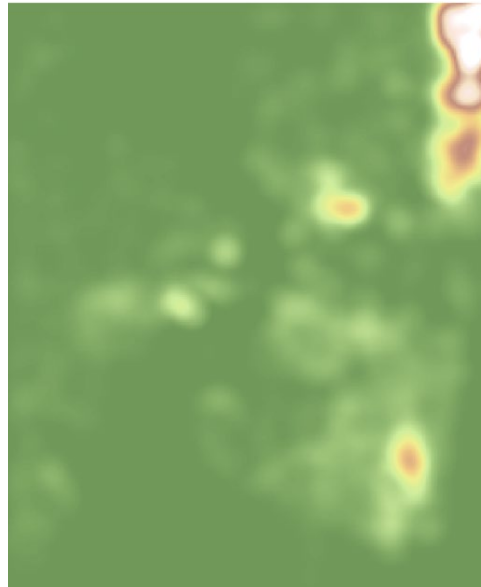
% of population living below poverty



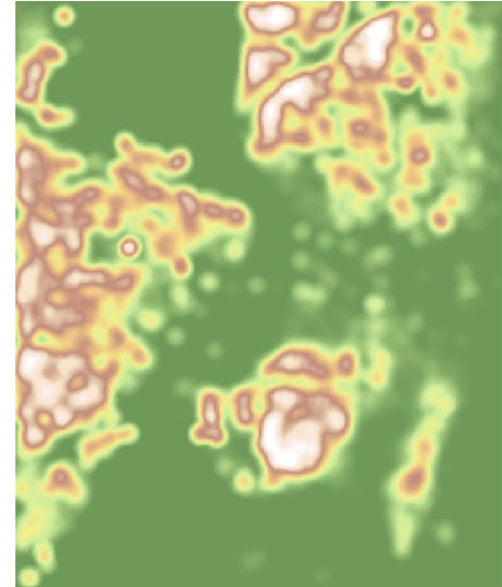
These layers all show a partial positive correlation with the incidents density.

Central Part_First Step_Calculate Density

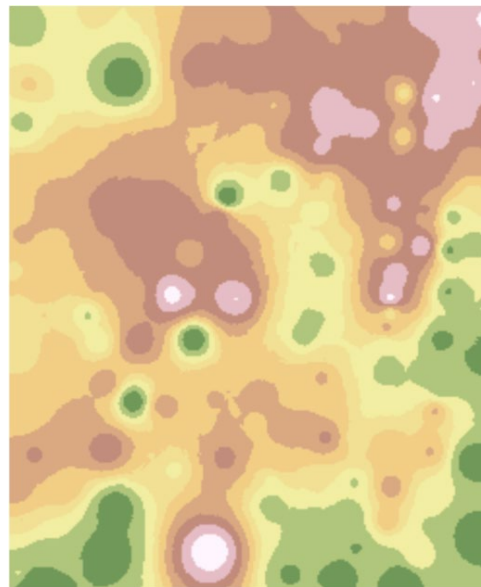
Hispanic Population



Non-hispanic Black population

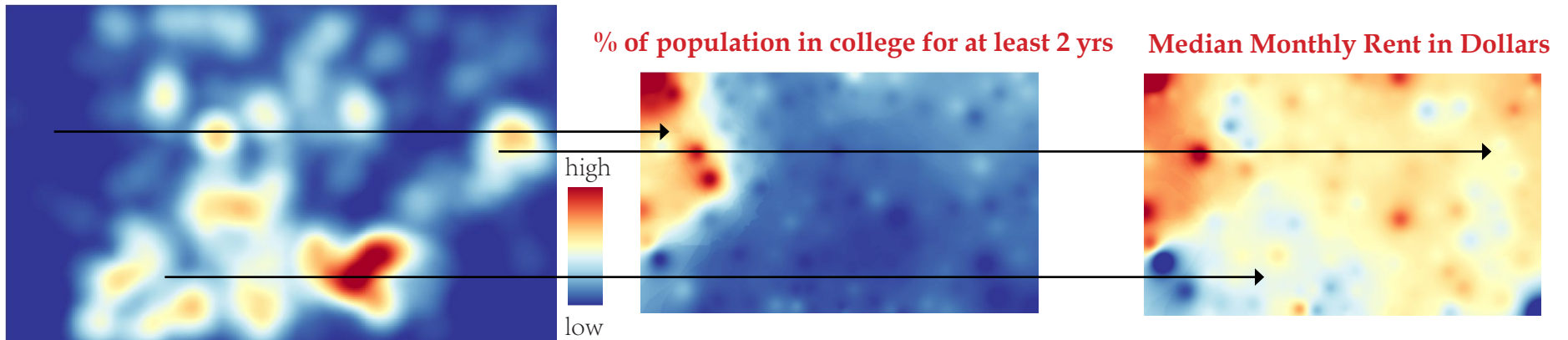


% of population living below poverty



Conditions-% of population living below poverty: Kernel Density
Populations- Hispanic Population: IDW
Populations- Non-hispanic Black Population: IDW

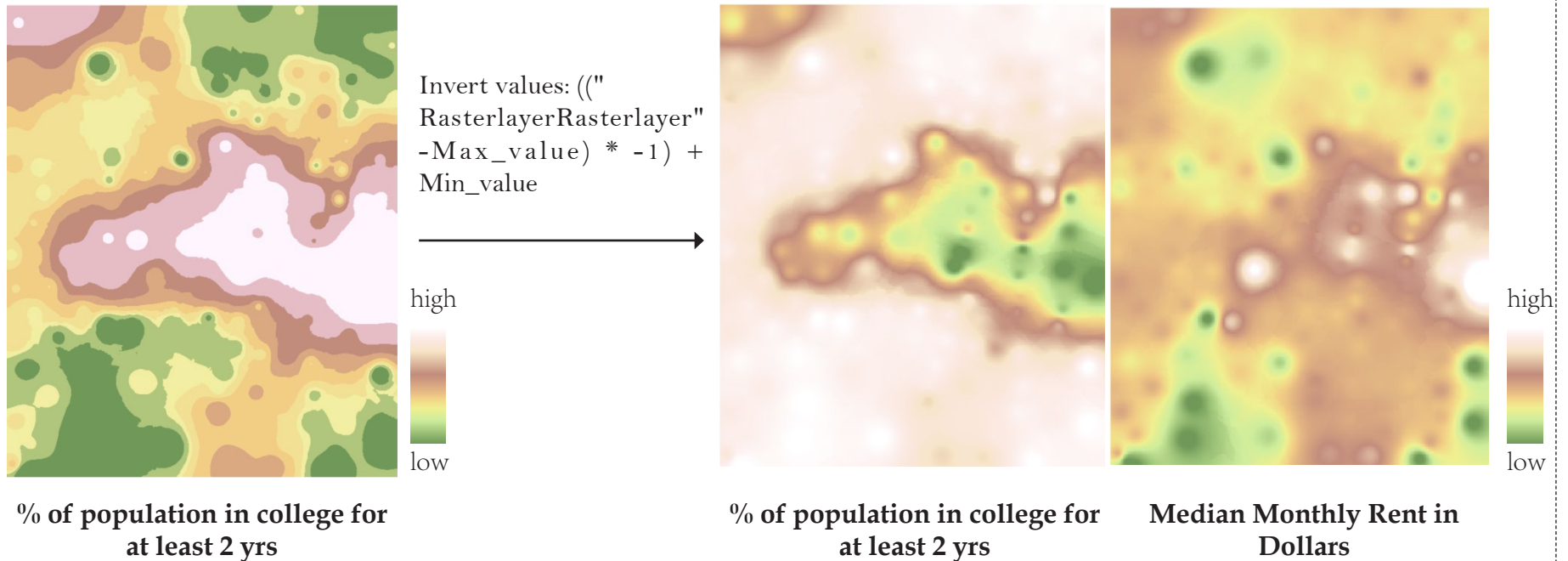
We do the same calculation for the three FEATURES who have high values associated with high gun crimes. The features are filtered by the NORTH part.
The results are as above.



Need to be inverted

For the *% of population in college for at least 2 yrs* and *Median Monthly Rent in Dollars* two sets of data, their spatial aggregation shows they have high values associated with low gun crimes, meaning that we should invert their values for future calculation.

Central Part_Second Step_Invert two density layers



Central Part_Third Step_Slice the layers

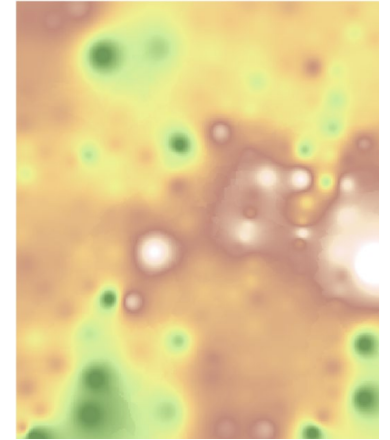
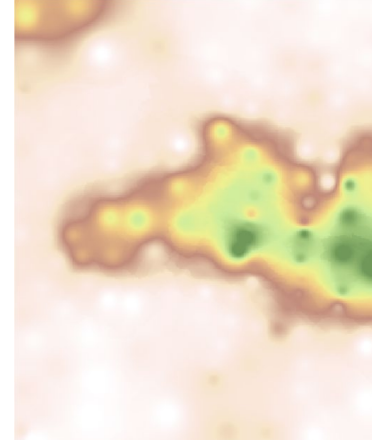
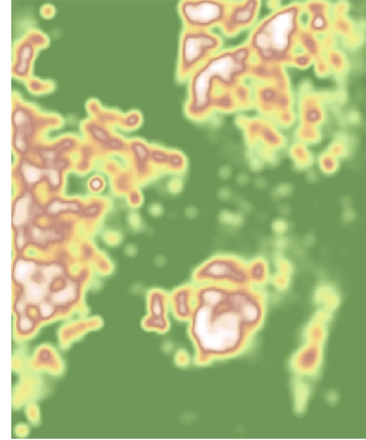
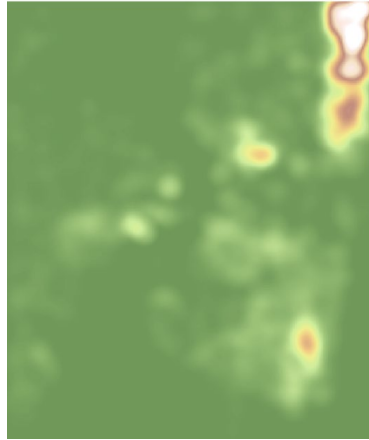
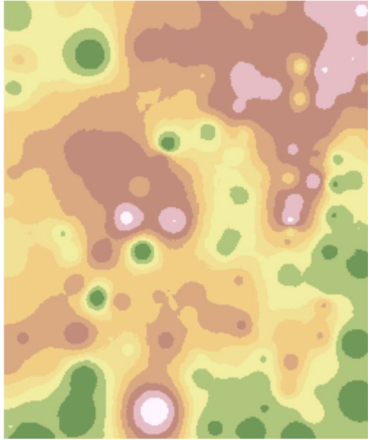
% of population living below poverty

Hispanic Population

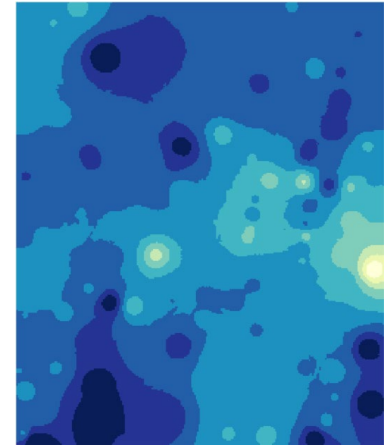
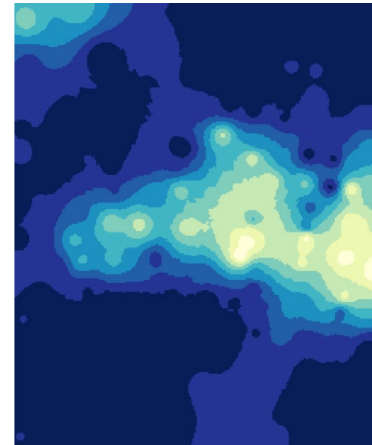
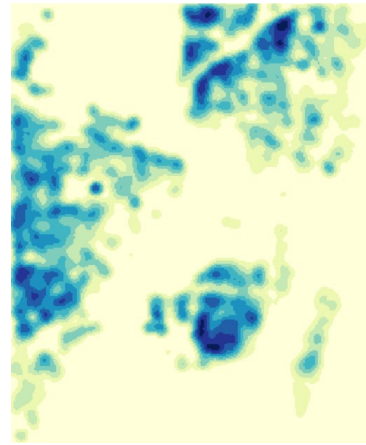
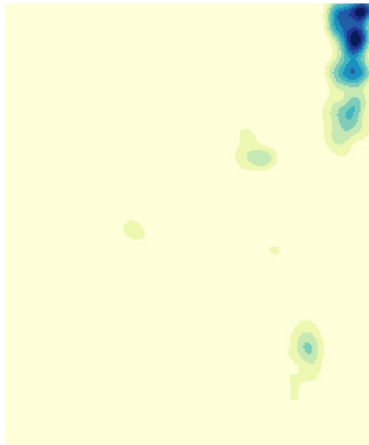
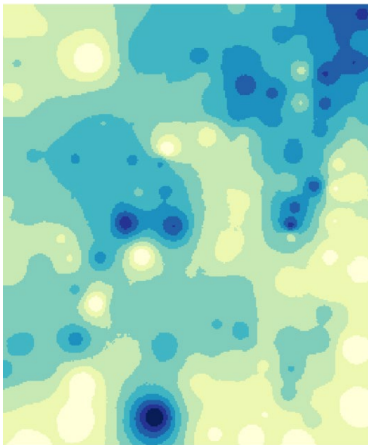
Non-hispanic Black population

% of population in college for at least 2 yrs

Median Monthly Rent in Dollars

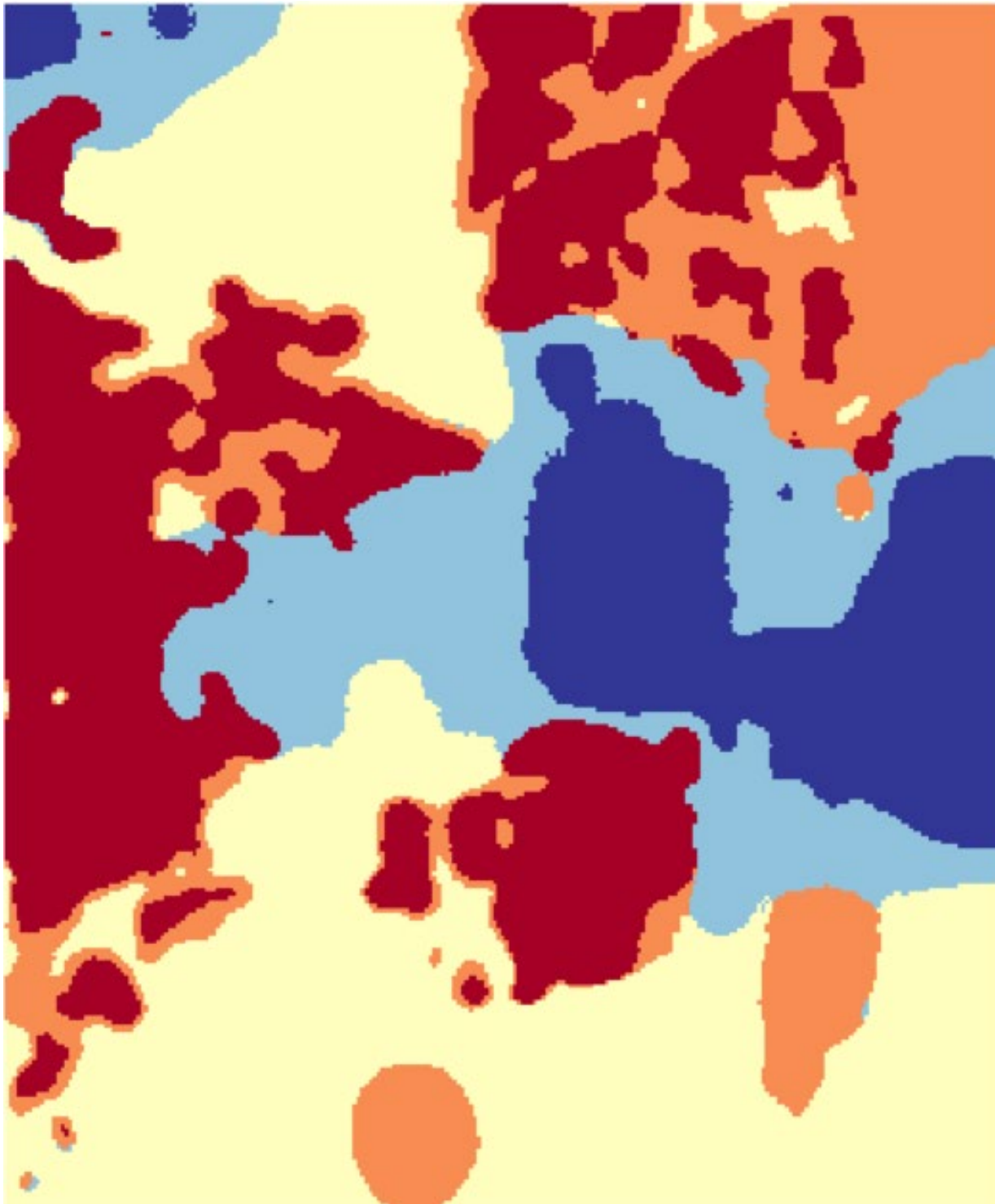


SLICE
Into 100 levels



To keep the values of all layers at the same level for subsequent overlays, the *Slice* tool is used and the layers are separated by 100 classes. The above figure shows the result after slice, where dark blue represents high value and light yellow represents low value.

Central Part_Final Step_Combination



Geoprocessing ▾ 📏 ✕

← Iso Cluster Unsupervised Classific... +

Parameters Environments ?

Input raster bands ▾

- Slice_Idw_pov ▾ 📁
- Slice_Kernel_hispanic ▾ 📁
- Slice_Kernel_nnblack ▾ 📁
- Slice_idw_medrent ▾ 📁
- Slice_idw_col ▾ 📁
- ▾ 📁

Number of classes

! Output classified raster 📁

Minimum class size

Sample interval

Using the *Iso Cluster Unsupervised Classification* Tool, I overlaid the five sliced layers together, setting the number of classes to five. Then, I changed the resulting symbology to visual the five classes directly. The red area on the left is the area with the highest predicted crime rate, while the dark blue part is the area with the lowest predicted crime rate.

