Assignment 08
IDW and Kernel Density

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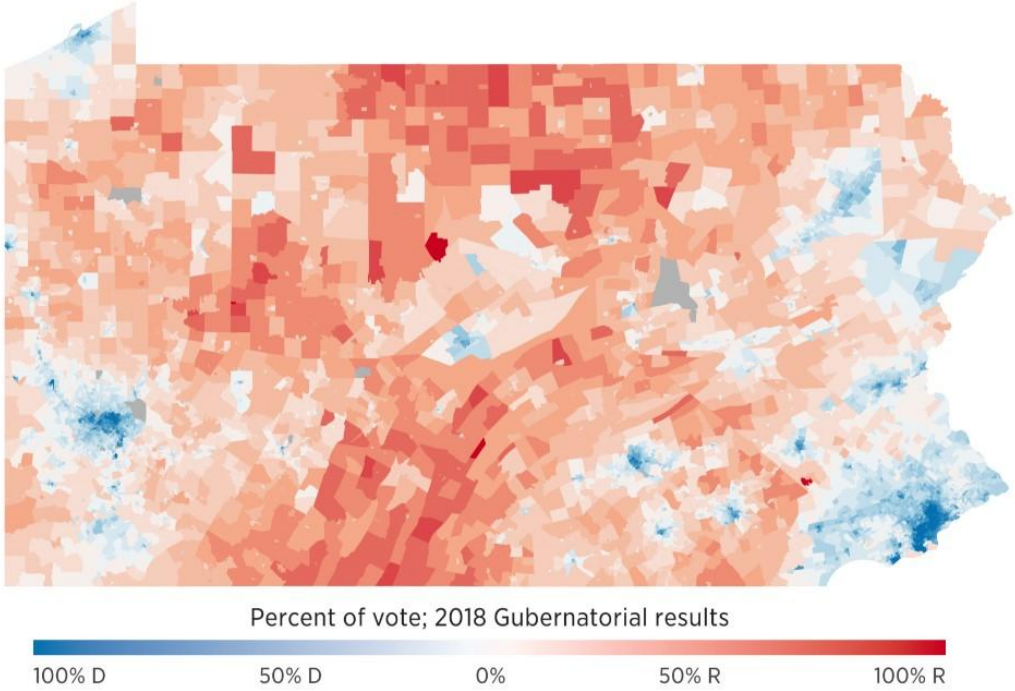
Prompt

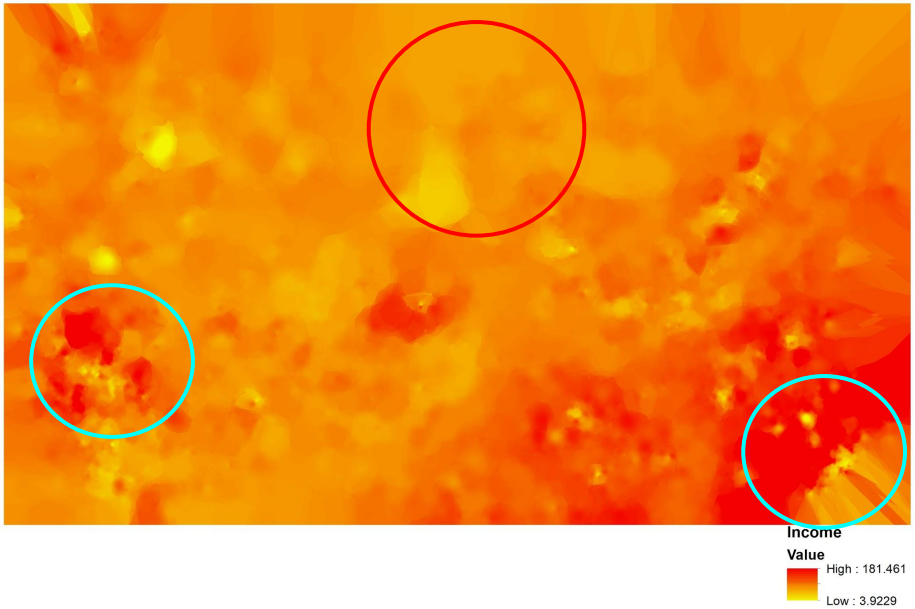
The aim is to determine which three of the following seven datasets best predict voting pattern:

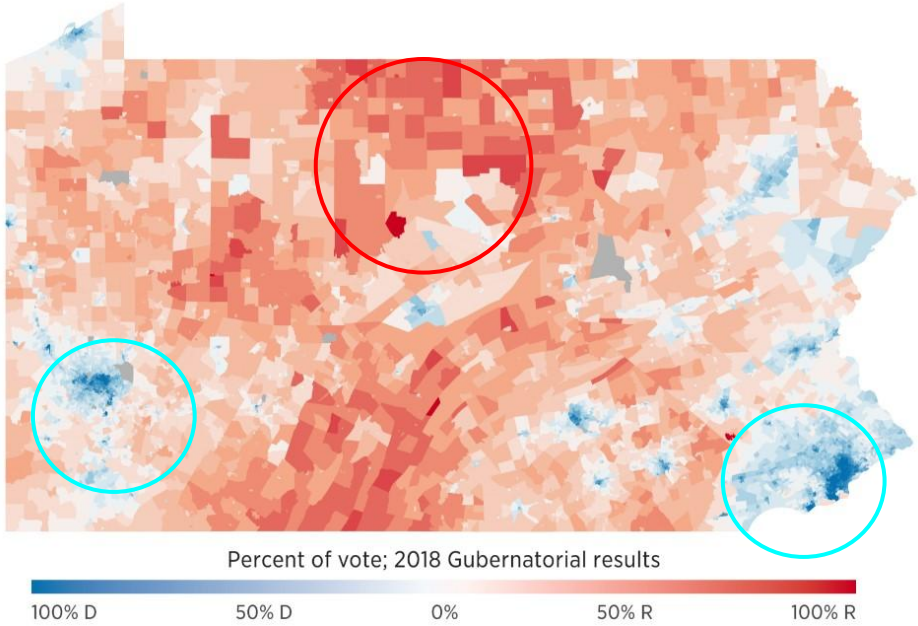


- population,
- percent of population that is white
- percent of population older than 65 years
- birth rate
- income
- number of people per dentist
- golf course locations.

IDW: Income

Income, Pennsylvania

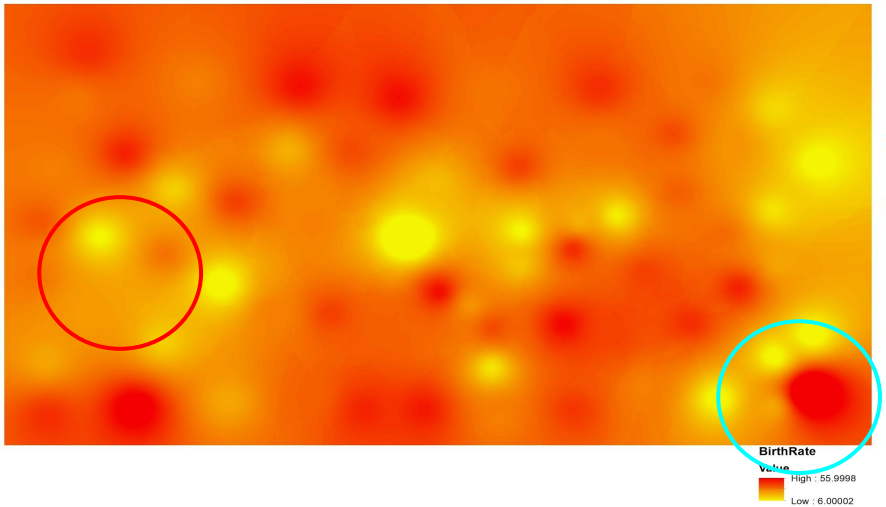


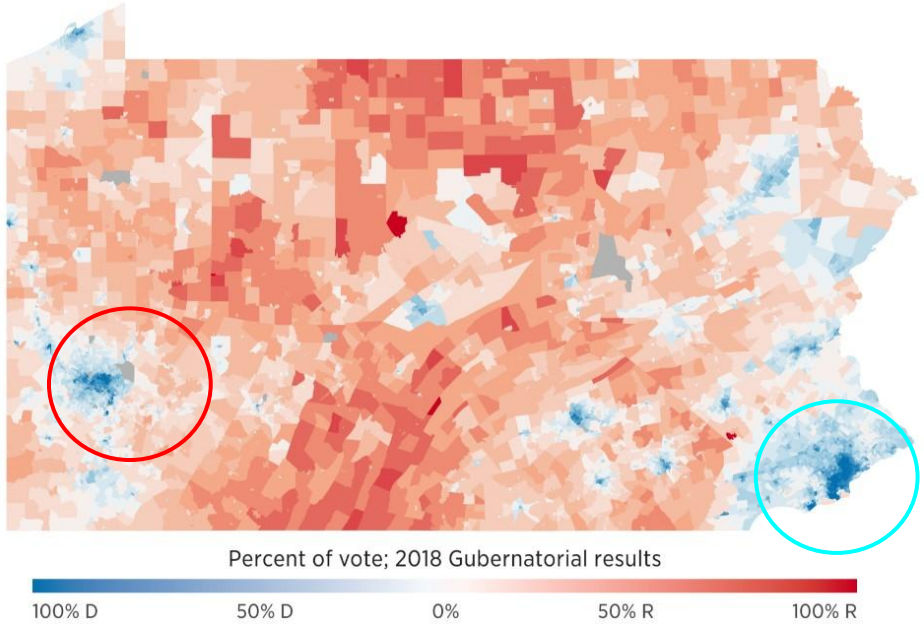


We use IDW with power of 2 and radius of 3. It seems that income is a relevant predictor as those areas that has higher income has higher percentage of democratic voting. Those areas with lower income seems to have higher percentage of republican voting.

IDW: Birth Rate

Birth Rate, Pennsylvania

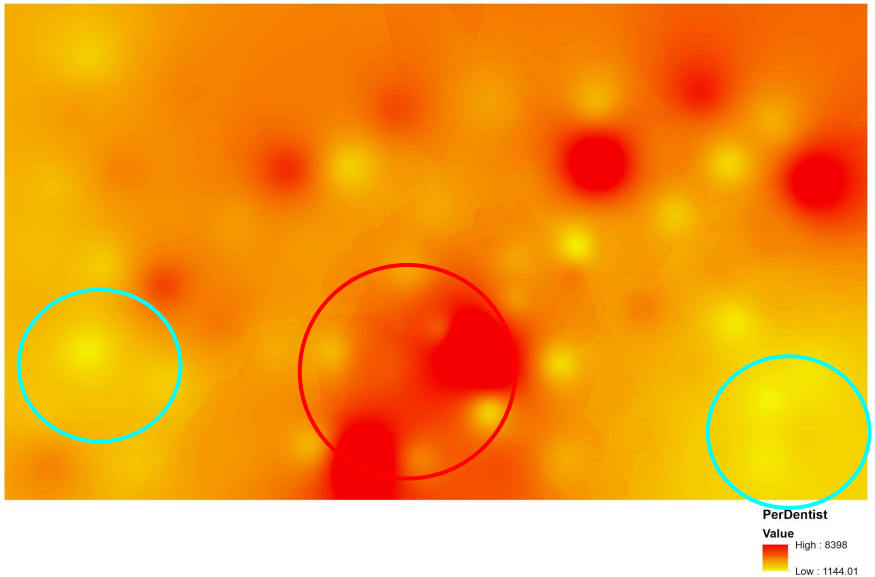


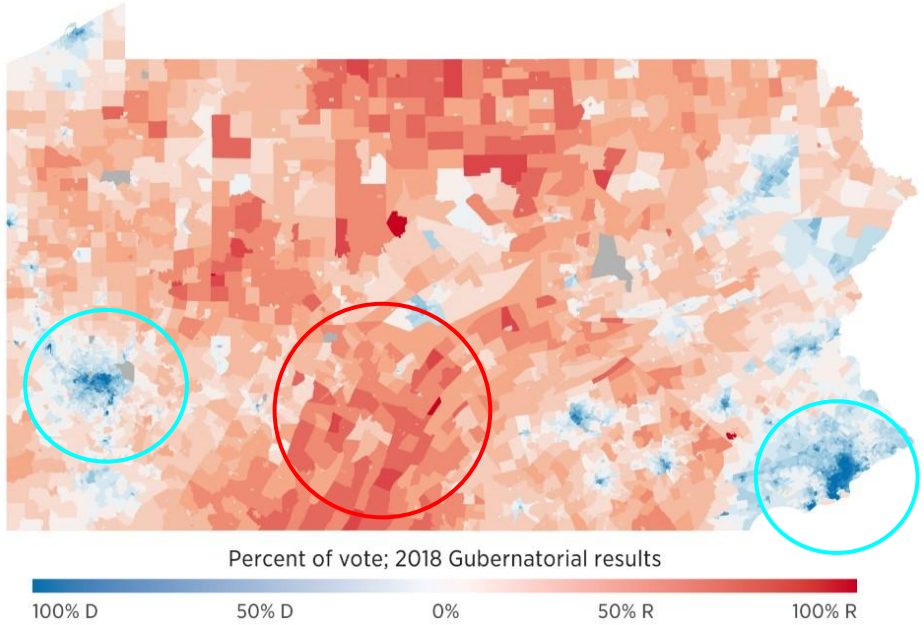


We use IDW with power of 2 and radius of 12. It seems that birth rate is not a very relevant predictor. At certain areas in blue circle, high birth rate is related with high democratic voting rates, whereas some other areas, low birth rates is still related with high democratic voting rates. The pattern is not obvious.

IDW: Number of People Per Dentist

Per Dentist, Pennsylvania

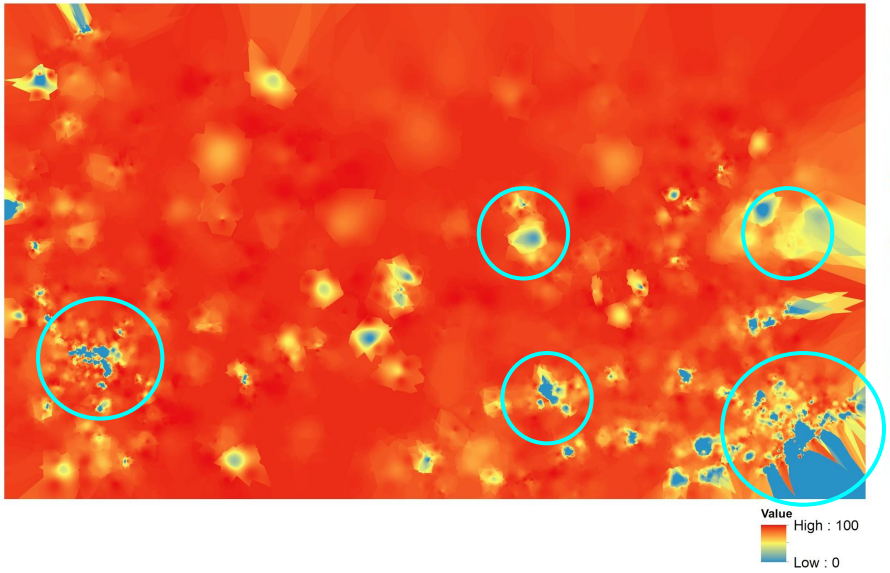


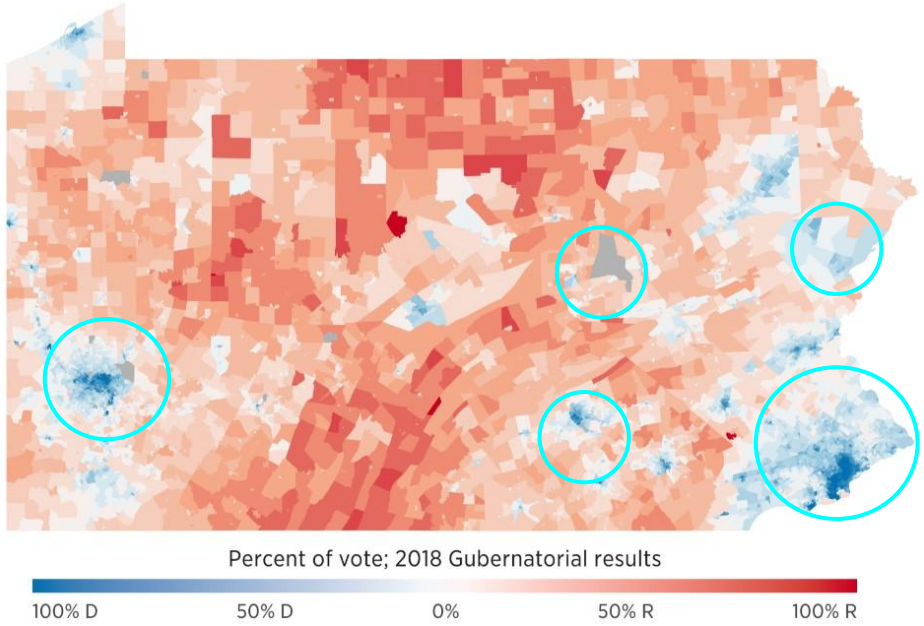


We use IDW with power of 2 and radius of 12. It seems that the number of people per dentist is a relevant predictor. Within areas with higher number of people per dentist, there is higher republican voting rate; within areas with lower number of people per dentist, there is higher democratic voting rate.

IDW: Percentage of White Population

White Population Percentage, Pennsylvania

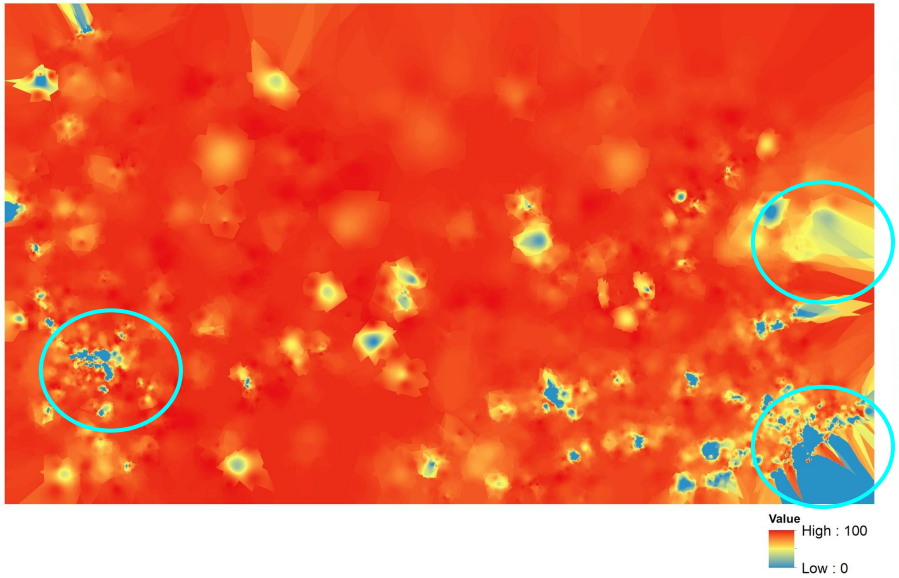


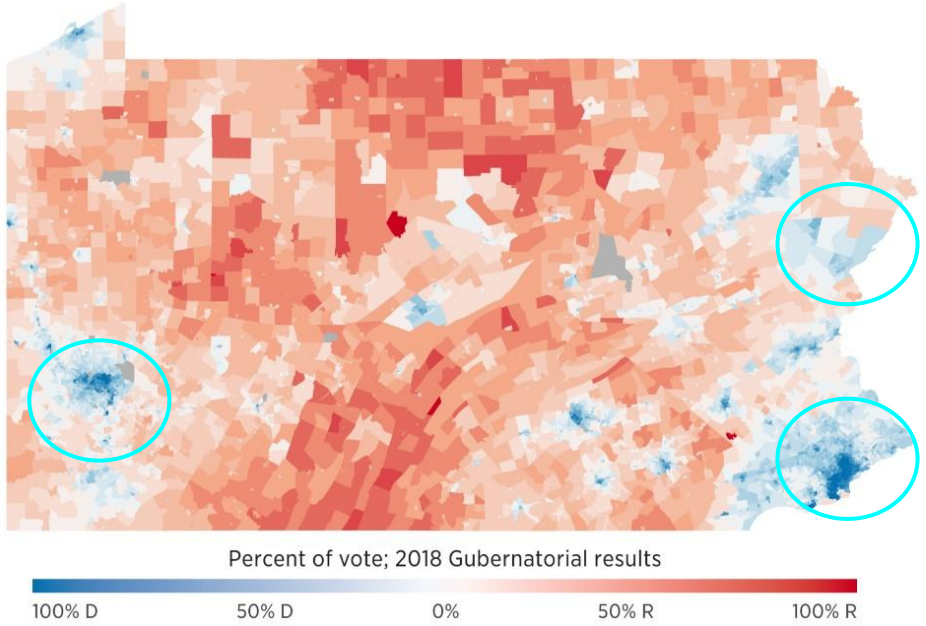


We use IDW with power of 2 and radius of 3. It seems that the percentage of white population is a very relevant predictor. Within areas with higher white population percentage, there is higher republican voting rate; within areas with lower lower white population percentage, there is higher democratic voting rate.

IDW: Percentage of Population Older than 65

Older Than 65 Population Percentage, Pennsylvania

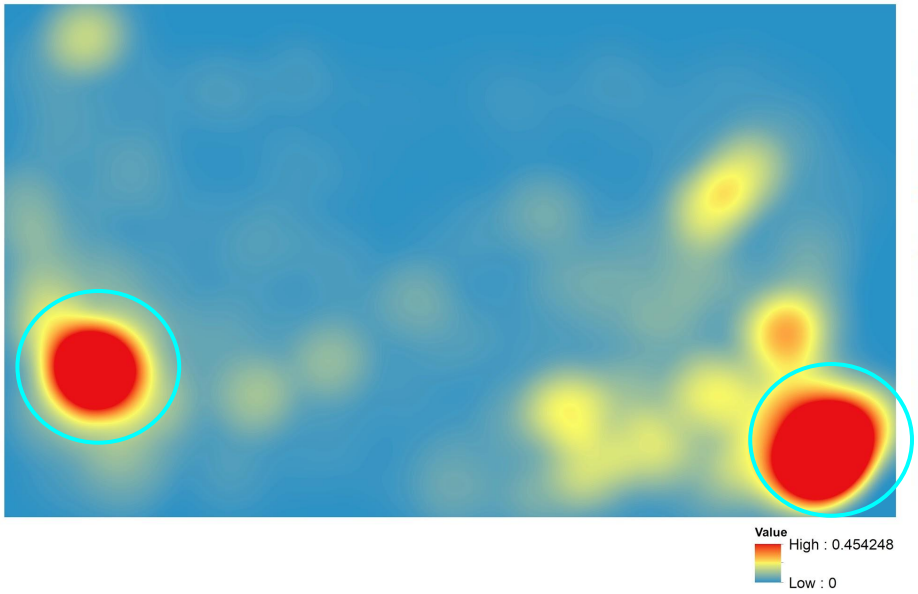


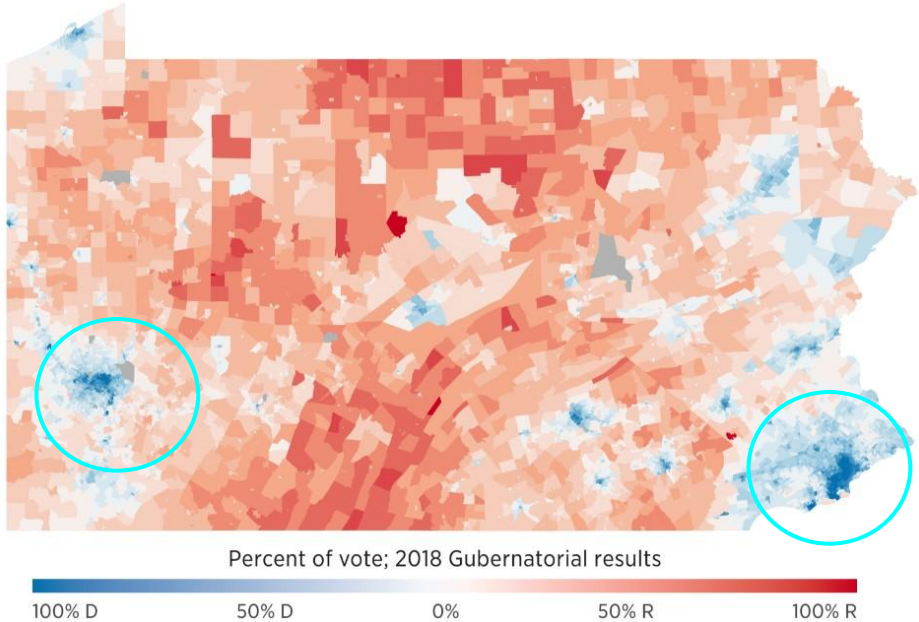


We use IDW with power of 2 and radius of 3. It seems that the percentage of population older than 65 is not a very relevant predictor. Within some areas with lower old population percentage, there is higher democratic voting rate. However, the pattern is not very clear.

IDW: Population

Population, Pennsylvania

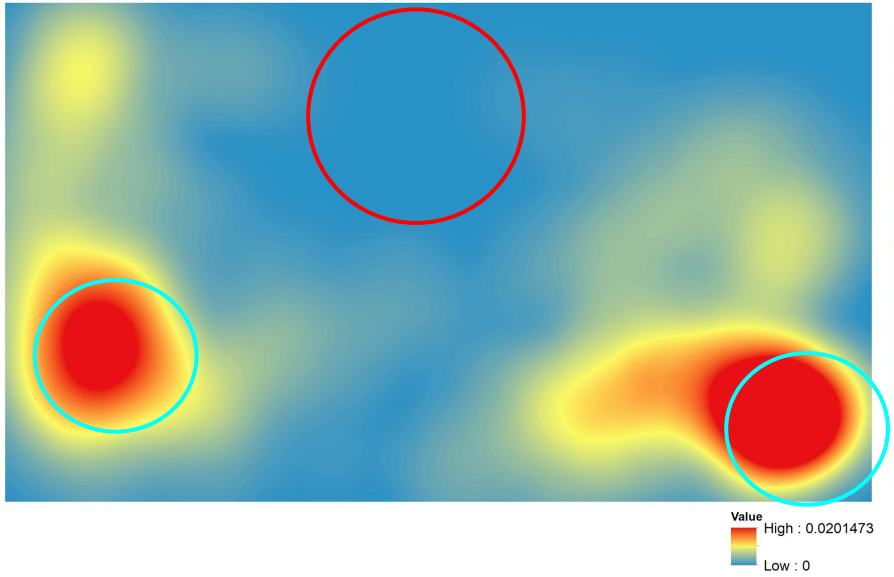


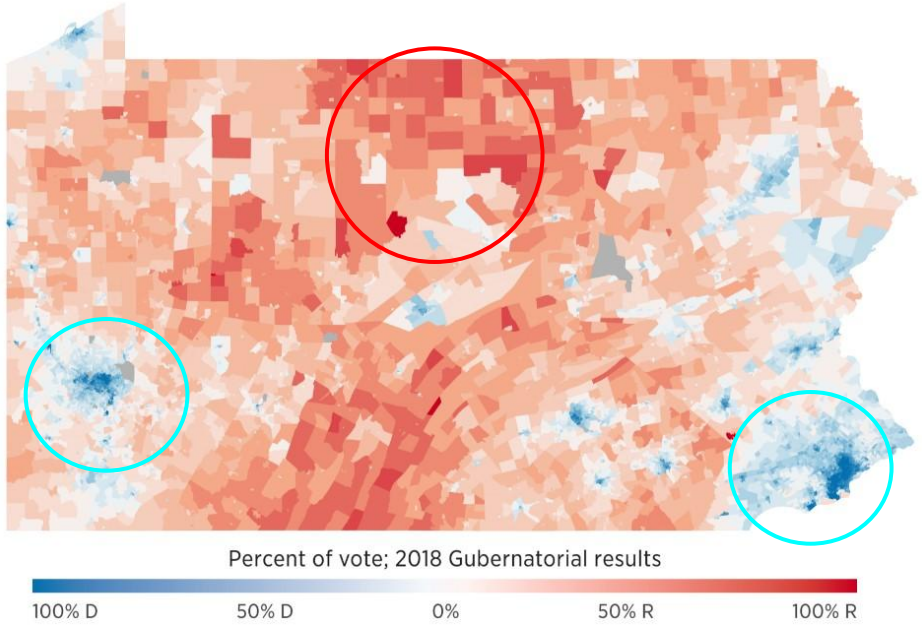


We use kernel density to estimate if population is related with the voting rates.. It seems that population not a very relevant predictor. Within some areas with more population, there is higher democratic voting rate. However, the pattern is not very clear.

IDW: Golf Course Locations

Golf Course Locations, Pennsylvania

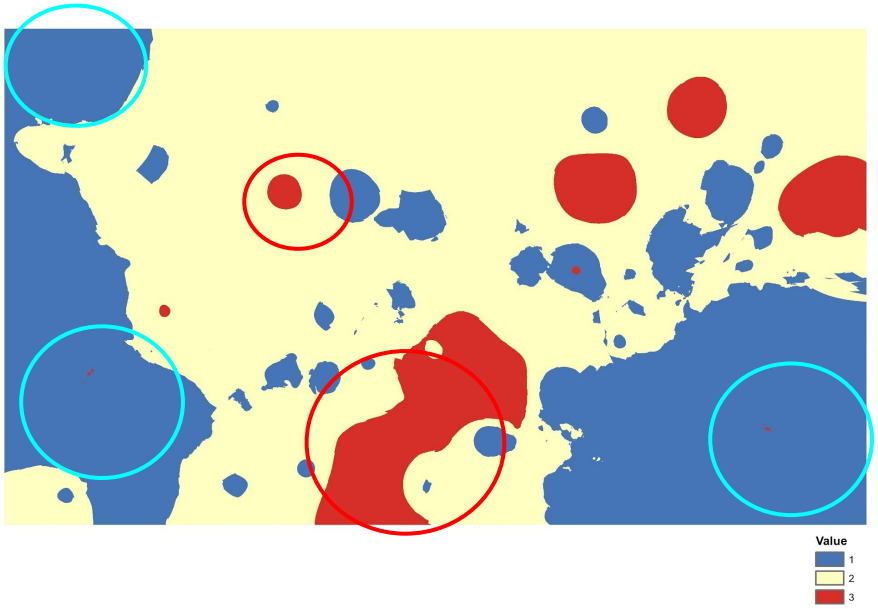


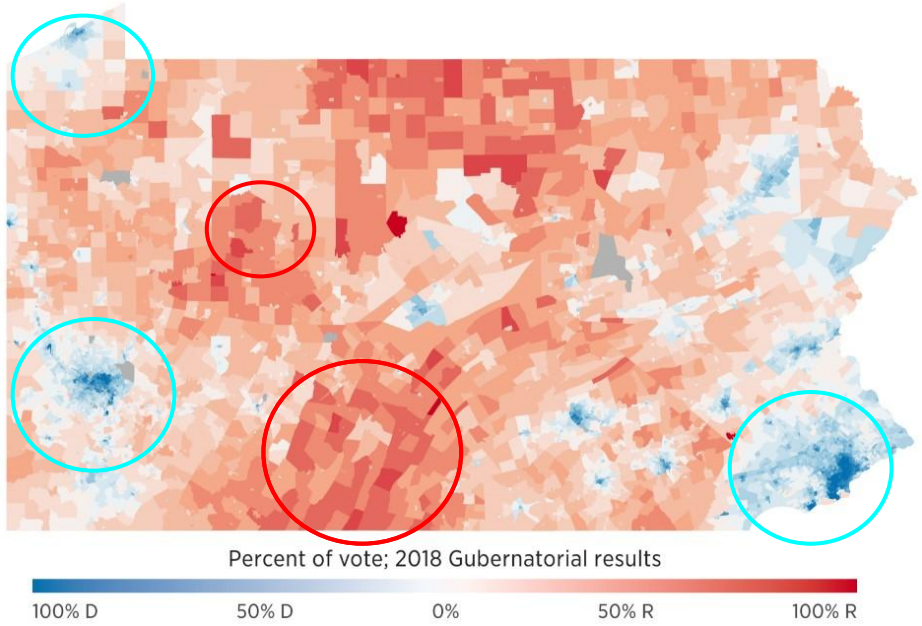


We use kernel density to estimate if golf course location is related with the voting rates.It seems that golf course location is not a very relevant predictor. Within some areas with more golf course locations, there is higher democratic voting rate. However, the pattern is not very obvious.

ISO Cluster: Predict Voting Rates

ISO Cluster, Pennsylvania





The three best predictors are Income, Percentage of White Populations, and Number of People Per Dentist. In factor, these three indicators are very correlated across neighborhoods. Then we use these three predictors to execute ISO cluster with three classes. It captures most of the patterns in voting rates.