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In my Geography 245 course, we discussed the average life expectancies of various races across the United States and learned that Asians Americans and Hispanics have the highest average life expectancies in the U.S. After deciding to do some further research on this, I have found that the exact statistics of the average U.S. life expectancies by race in 2009 from highest to lowest are 86.5 years for Asian Americans, 82.8 years for Hispanics/Latinos, 78.9 years for Whites, 76.9 years for Native Americans, and 74.6 years for African Americans (Kaiser Family Foundation). Seeing as this is how life expectancies play out across races in the U.S., could this trend be the similar for Washington State as well? Have the shifts in populations of these races influenced the changes in life expectancies in different counties of Washington State based on data from 2000 and 2010?

Regarding the difference in life expectancies map, I used data from the Institute for Health Metrics and Evaluation’s interactive U.S. Health Map visualization. Their website contained a dataset that had the average life expectancies in years by gender and county from 1985 to 2010 for every five years. Attributes in the dataset include average female life expectancies by year and for males as well. I decided to create two new columns, one for 2000 and the other for 2010, that would contain the average life expectancies of females and males together by averaging the two from the same year. Then, to find the differences of the averages from 2000 and 2010 I created a third column that deducts the 2010 average from that of 2000. For the differences in population maps, I used data from the American Factfinder website from the U.S. Census Bureau. I was able to find two tables, one of data from the year 2000 and the other from 2010. The table attributes from both tables include the different populations of each race alone by counties. To prepare the data of differences in populations from 2000 to 2010, I had to join these two tables together and produce new columns for each race that would contain the differences. The data in these columns was created by subtracting the 2010 column of each race from that of 2000.

I initially had a shapefile that contained all the counties within the United States, but needed to reduce it to only counties within Washington State. To do this, I first found that all counties within Washington had a “STATEFP” value of 53, then proceeded to select by attributes with the following query: SELECT \* FROM cb\_2015\_us\_county\_500k WHERE "STATEFP" = '53'. With these specific counties selected, I finished with a clip analysis where both the input and clip features were the “cb\_2015\_us\_county\_500k” layer and created the desired layer of only counties within Washington State.

When creating the maps with differences in population, I used graduated colors to represent the values. Some counties had decreases in population which I visualized with values of red, with light red being little decreases in population, and red being high decreases in population. Counties with increases in population are visualized with values of dark green, with white being little increases in population, and dark green being high increases in population. I also used graduated colors for the differences in average life expectancies map and visualized the increases with values of brown. The interval size for each of the population maps is 10,000 to enable clearer comparisons between maps, with the exception of the map for African Americans which is in increments of 5,000 people due to less population change. The interval size for the life expectancy map is 0.25 years to demonstrate more variations of life expectancy change.

King, Skamania, and Klickitat counties, with 2.26 to 2.50 years increase in average life expectancies each, had the highest changes in life expectancy out of all other counties in Washington State. Analyzing the population changes in King County, we see that there was a 20,000 to 23,827 decrease in the population of white people, a 20,001 to 25,000 increase in African Americans, a 70,001 to 80,000 increase in Hispanics/Latinos, and a 90,001 to 100,000 increase in Asian Americans. From this information, we could say that the drastic increase in Hispanics/Latinos and Asian Americans and decrease in White people could have highly contributed to the large increase in average life expectancy in this county. Skamania County, which had a 1 to 10,000 increase in White people, Hispanics/Latinos, and Asian Americans each, and a 1 to 5,000 increase in African Americans, does not have similar changes in population at all compared with King County, which could be due to different factors leading to the large increase in average life expectancy. In Klickitat County, the increase in population among all races is the same, except for Asian Americans whose population has decreased by 0 to 14 people. The county that had the least change in average life expectancy was Clallum County, with an increase of only 0.30 to 0.50 years. Oddly enough, the population changes throughout all races were the same as those of Skamania County, leading to the conclusion, for now, that changes in population by race may not highly affect the changes in life expectancies in Washington State counties.

Since this was my first course learning about GIS, I wanted to make this project simple, but at the same time have it educate myself about the outcome of my research question and how I may improve the design of my projects in the future. In regards to that, if I were to redesign my project, I would like to take more statistics courses first so I can incorporate the numbers into my analysis and provide a more thorough conclusion. Later on, I could research the same question, but for counties in other states as well; perhaps I could also test data other than changes in population by race, for instance changes in population by income or education levels.

Works Cited

“Life Expectancy at Birth (in years), by Race/Ethnicity.” *Kaiser Family Foundation*, 14 Dec. 2016, <http://kff.org/other/state-indicator/life-expectancy-by-> re/?currentTimeframe=0&selectedRows=%7B%22wrapups%22:%7B%22united- states%22:%7B%7D%7D%7D.









