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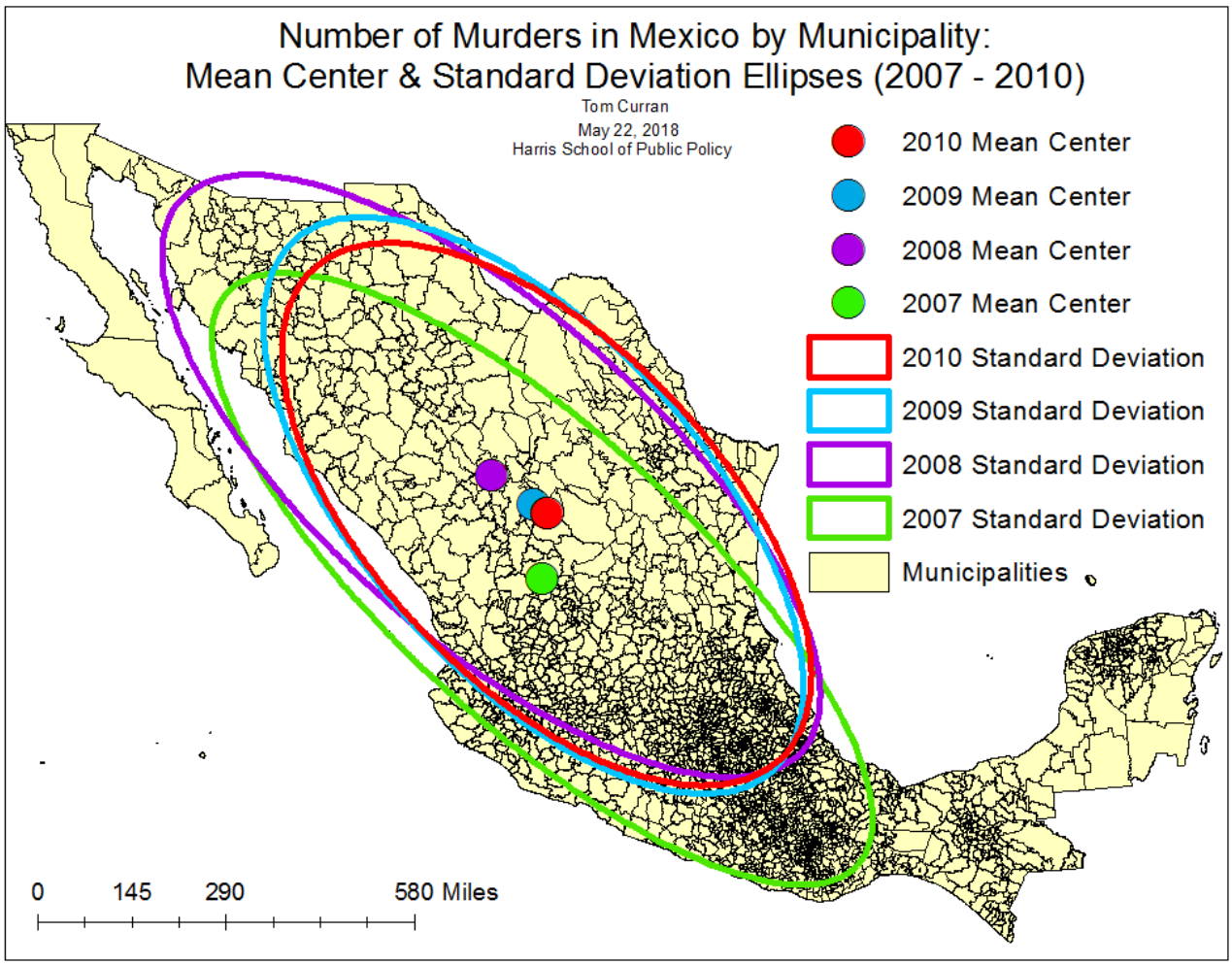
May 22, 2018

Assignment 4 – GISAITSS 38520-01 – Spring 2018 – 05/22

Questions.

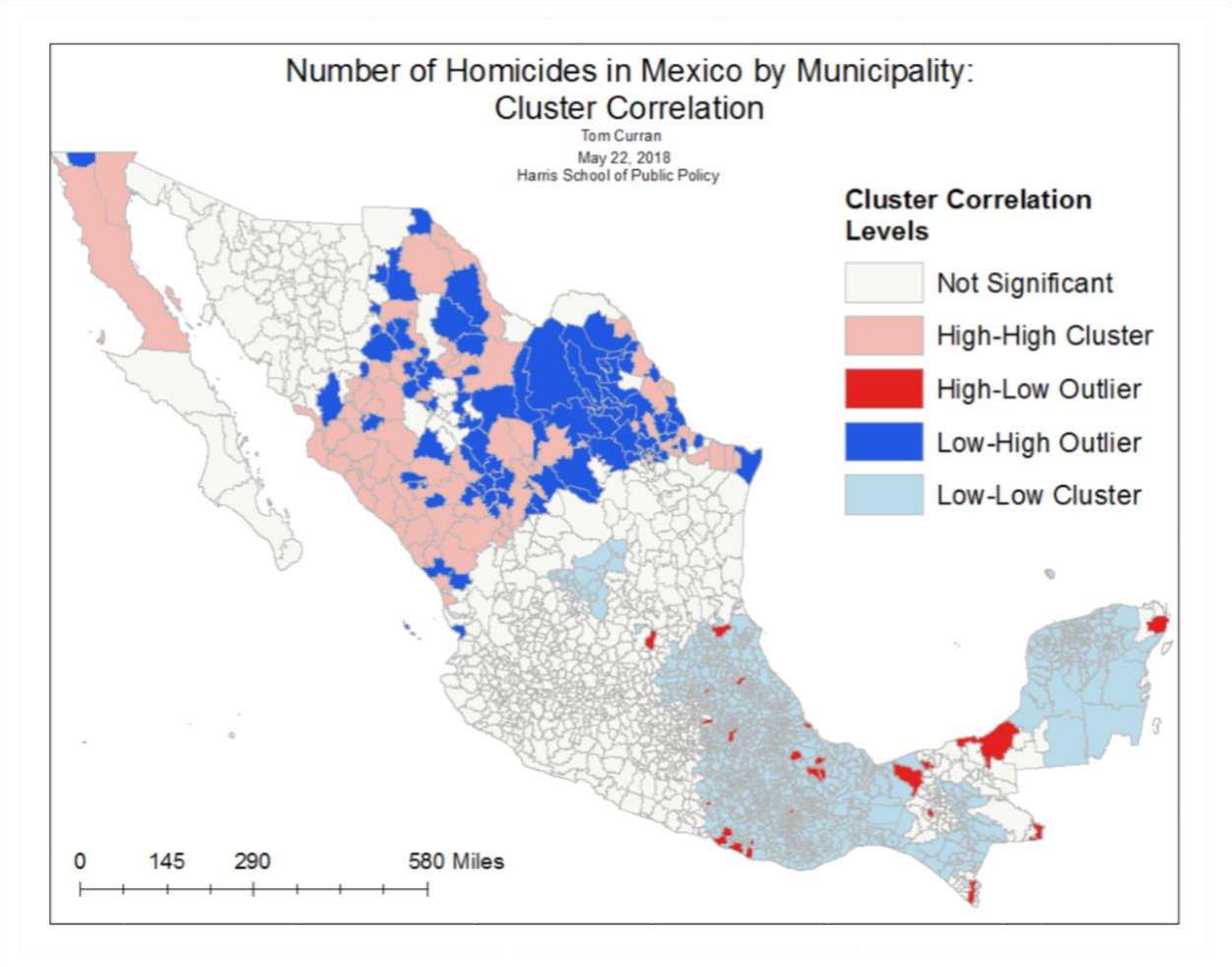
1. Can you identify any pattern of how violence has changed in Mexico using mean center and standard deviation ellipses? Please describe and show a map with your results illustrating your findings (2 *Points)*

Based on the below map, it appears that the mean center is moving north. With 2008 mean center (purple circle) the most extreme north and furthest distance traveled from the previous year (2007 Mean Center – green). After 2008 (purple) it appears the mean center 2009 (blue) traveled south and then south again in 2010 (red) but only slightly, and still north of the 2007 (green) mean center. The standard deviation ellipses appear to be very large in 2007 (green) and 2008 (purple) and seem to be slightly shrinking in 2010 (red) and 2009 (blue). Like the mean centers, the standard deviation ellipses move north, and then slightly south in 2009 and slightly more south in 2010, but never traveling as far south as the 2007 mean center.



2. Where are the most clustered municipalities in Mexico in 2010? Please describe and show a map to illustrate your findings. *2 Points*

The regions in the north are divided into two clustering patterns. Generally, we see that municipalities near the north east side of Mexico have a Low-High relationship, where the municipalities are outliers. On the north west side of the country, the municipalities are part of the high-high cluster. The majority of municipalities in the southern part of Mexico are part of the low-low cluster. The southern portion of Mexico, through mostly dominated by low-low cluster, does have some of the High-Low outlier scattered throughout.

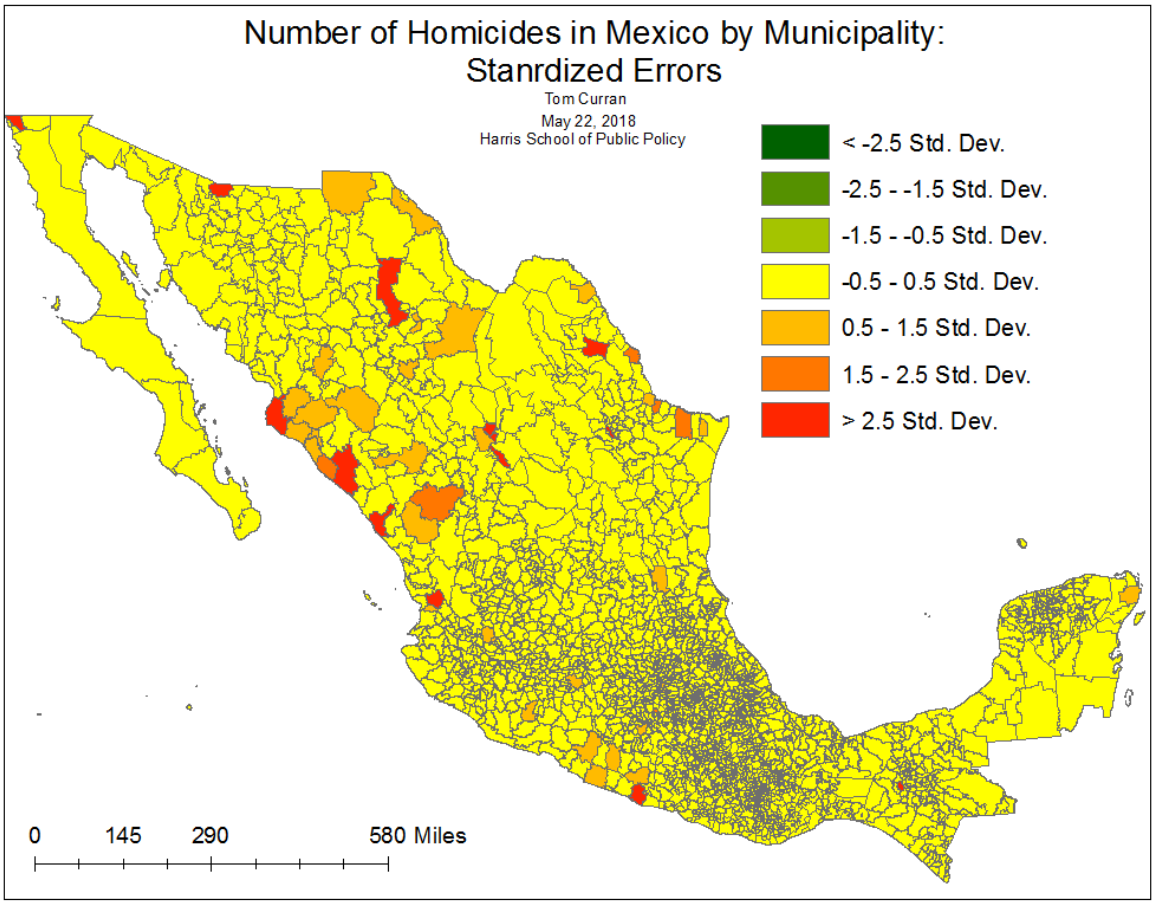


3. Did you find any statistically significant correlation between education and violence in Mexico for 2010? Do your findings make any sense? Use the results from your report for your answer, but not limit your analysis to it. Show a map displaying standardized errors of your estimated model. *3 Points*

Summary of OLS Results - Model Variables

Variable	Coefficient [a]	StdError	t-Statistic	Probability [b]	Robust_SE	Robust_t	Robust_Pr [b]
Intercept	-22.259889	5.553977	-4.007918	0.000071*	4.330477	-5.140286	0.000001*
YEARS_OF_EDU	4.238481	0.813161	5.212349	0.000000*	0.765680	5.535580	0.000000*

Based on the OLS run in ARC GIS, there is a statistically significant relationship between Years of Education for people over the age 15 (YEARS_OF_EDU_15Y_ABOVE) and the Number of Homicides in a municipality for 2010. In this case, for every additional year of education the number of homicides increases by approximately 4.24. While it is statistically significant, the Adjusted R squared for the regression is 0.010547 which means very little of the variance is explained by just the Years of Education variable. Furthermore, the regression makes little sense as years of education is typically associated with lower poverty level and typically places with low poverty have less homicide/violence. Therefore, it does not make much sense to increase violence with more education as it has an inverse relationship (typically) with poverty which is a catalyst for violence in many cases.



4. Using the tools you learned in assignment 3, create a map where you display the number of homicides in Mexico for each year for the 2007-2010 period. *3 Points.*

Number of Homicides in Mexico by Municipality

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Assignment #4
May 29, 2018