Geospatial Correlates of Black Lives Matter Protests in Florida

Darren Colby, Sophia Carter, Pierce Wilson, Alessandra Cassiano-Salinas | Geography 9.01 | Fall 2020

Background

Context: Police violence against unarmed Black folks in the U.S. in 2020 has led to protests against police brutality.

Research Question: How do proximity to universities, racial imbalance, voter party, and wealth affect the likelihood and number of protests occurring in Florida census tracts?

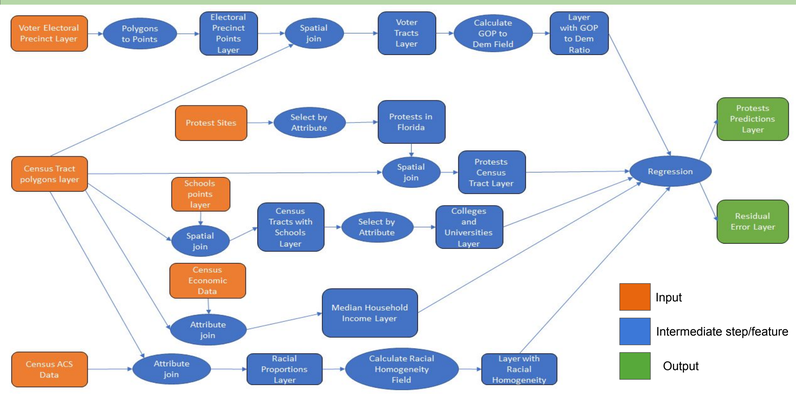
Hypotheses: Greater racial imbalance and more universities increases the number and probability of protests. Lower levels of wealth and Democrats decreases the probability and number of protests.

Factors

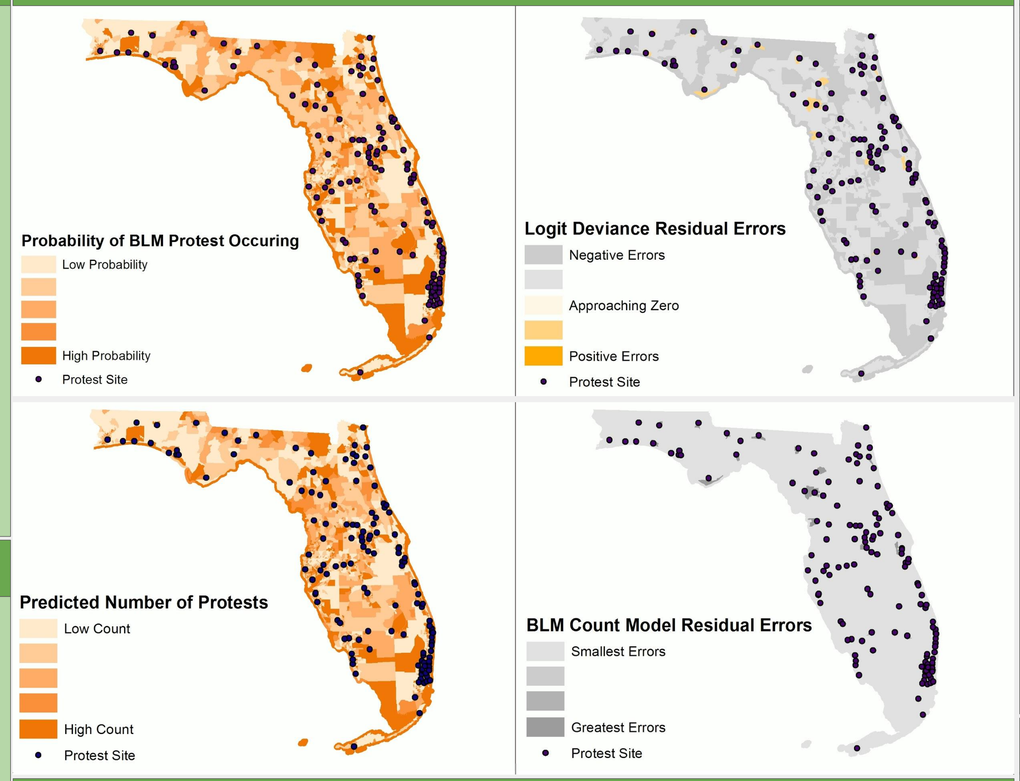
- **Universities** in each tract (with dummy and continuous variables)
- **Political Affiliation:** GOP/Dem voters in 2018 primaries in each electoral precinct
- **Racial Balance:** Sum of the percentage of each race in each tract squared and then standardized
- **Wealth:** Median Household Income

Methodology

- Join voting data to census tracts
- Join other layers to census tracts
- Run logit and poisson regressions
- Visualize results



Black Lives Matter Protests and Residuals



Regression Results

Predicted Number of BLM Protests

	Protest Count						
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Schools	0.321**		0.319**	0.319**	0.323**		
	(0.142)		(0.142)	(0.147)	(0.146)		
Schools Dummy		0.712***				0.686***	1.344**
		(0.237)				(0.239)	(0.554)
GOP to Dem Ratio			-0.145	-0.107	-0.117	-0.121	-0.116
			(0.101)	(0.099)	(0.102)	(0.103)	(0.103)
Median Household Income				-0.00001**	-0.00001**	-0.00001**	-0.00001
				(0.00000)	(0.00000)	(0.00000)	(0.00000)
Racial Homogeneity					0.194	0.216	0.203
					(0.474)	(0.477)	(0.479)
Schools Dummy:Median Household Income							-0.00001
							(0.00001)
Constant	-3.491***	-3.531***	-3.361***	-2.974***	-3.065***	-3.131***	-3.220***
	(0.090)	(0.094)	(0.123)	(0.212)	(0.311)	(0.317)	(0.328)
N	4245	4245	4245	4245	4245	4245	4245
Log Likelihood	-598.630	-596.705	-597.493	-595.081	-594.997	-593.282	-592.469
AIC	1201.259	1197.411	1200.985	1198.162	1199.994	1196.563	1196.938

***p < .01; **p < .05; *p < .1

Probability of a BLM Protest Occuring

	Protest Occurence						
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Schools	0.344**		0.348**	0.345**	0.337**		
	(0.153)		(0.153)	(0.156)	(0.157)		
Schools Dummy		0.743***				0.708***	1.443**
		(0.244)				(0.246)	(0.581)
GOP to Dem Ratio			-0.260	-0.182	-0.162	-0.172	-0.167
			(0.164)	(0.167)	(0.172)	(0.172)	(0.172)
Median Household Income				-0.00001**	-0.00001*	-0.00001*	-0.00001
				(0.00000)	(0.00000)	(0.00000)	(0.00000)
Racial Homogeneity					-0.209	-0.181	-0.188
					(0.386)	(0.387)	(0.388)
Schools Dummy:Median Household Income							-0.00002
							(0.00001)
Constant	-3.462***	-3.501***	-3.259***	-2.894***	-2.840***	-2.897***	-2.995***
	(0.091)	(0.095)	(0.152)	(0.225)	(0.245)	(0.249)	(0.261)
N	4245	4245	4245	4245	4245	4245	4245
Log Likelihood	-596.359	-594.380	-595.093	-592.761	-592.613	-590.869	-589.931
AIC	1196.718	1192.761	1196.185	1193.521	1195.227	1191.739	1191.862

***p < .01; **p < .05; *p < .1

Discussion

- Most accurate models for count and likelihood were Model 6
- Statistically significant factors
  - Wealth (median household income)
  - Universities
- Orange maps show predictions, grey maps show residuals
- Top two maps show results from logit model, bottom maps show poisson model
- Highest errors were in the northern part of the state with more Republicans
  - logit model overestimated the probability of protests in these areas

Conclusion and Next Steps

- Universities and wealth **are** causal factors, racial balance and political party distribution **are not.**
- This analysis would have been impossible without GIS
- Future research could investigate whether these results hold across states
- Could also examine how patterns in Black Lives Matter protests change when university classes are in session

Data Sources

- U.S. Census American Community Survey
- U.S. Census Selected Economic Indicators
- Florida Geospatial Data Library
- United States Electoral Project
- GYSTOE ArcGIS Online Page