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CEE 194: Intro to GIS
Summer 2009

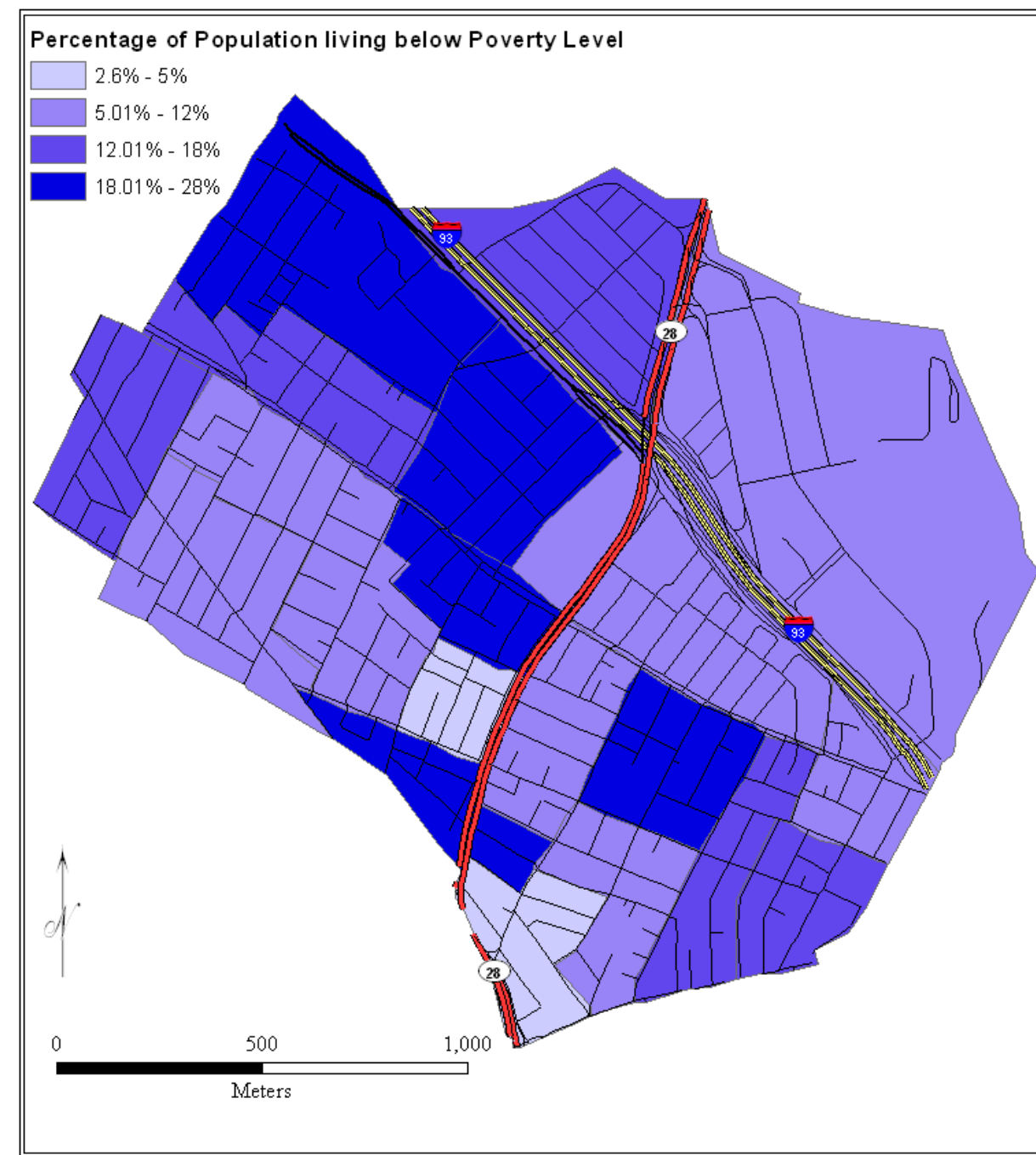# Analysis of Somerville Communities Near Interstate 93

Tufts UNIVERSITY
School of Engineering

Figure 1: Map of the percentage of the total population who live below the poverty level. The data was adapted from the **income_poverty_levels_by_age.dbf** file on the MassGIS website.
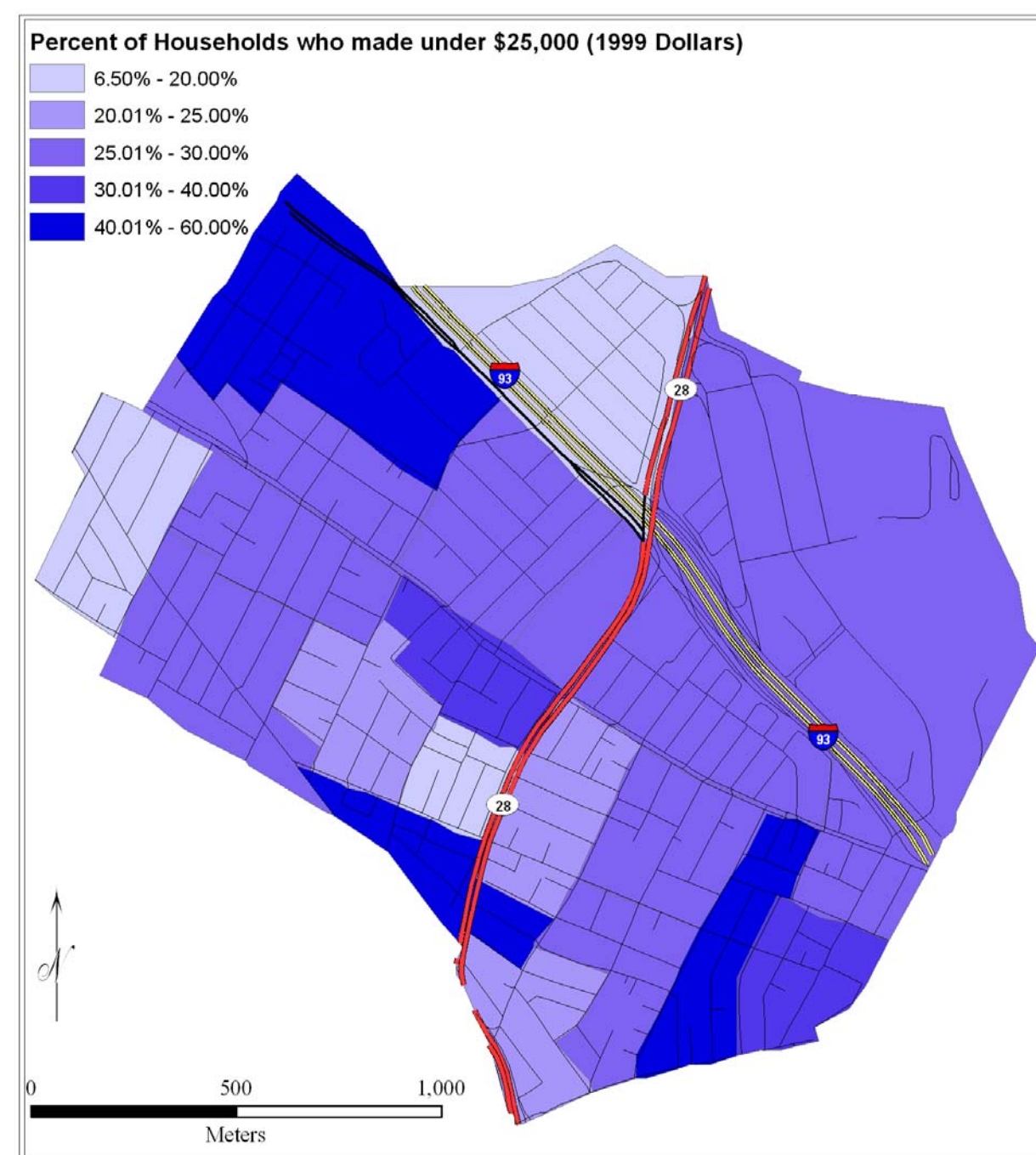

Figure 2: Map of the percentage of households who make less than $25,000 in 1999 Dollars. This map was created with data adapted from **legattrib.dbf** file on MassGIS.
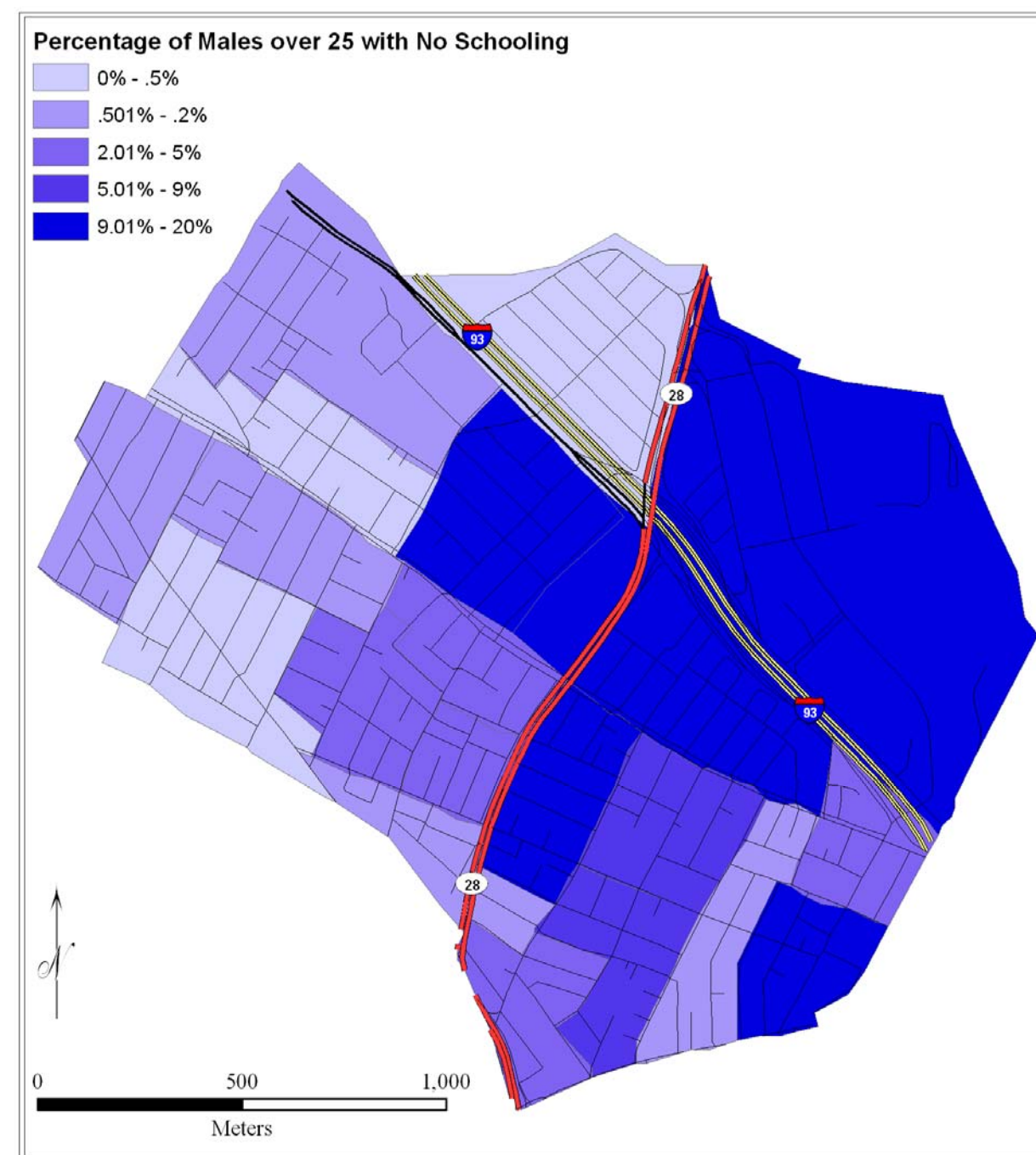

Figure 3: Map of the percentage of Males older than 25 who have no schooling. I used the data from the **education_attainment_by_gender_age.dbf** file on MassGIS.

Overview:

A LULU is a locally undesirable land use or land features that people do not want to live near. Examples include hazardous waste sites, airports, or highways. Highways are generally regarded as unwanted neighbors because of the noise and air pollution.

Purpose:

The purpose of my project is to determine if a correlation exists between the SES of people who live near highways and their distance from the highway. The communities I studied were located in Somerville, Mass. and were located within about 1.5 kilometers from Interstate 93.

Methods:

All of my data was downloaded from MassGIS (http://www.mass.gov/mgis/). The data layers I used were the 2000 Census tract and block group layers. I also used the Office of Transportation map for Somerville, Mass for the road layers. I used these data layers to create a map of the three tracts closest to Interstate 93 and to break down the data into block groups. I also downloaded tables with data from MassGIS that contained 2000 Census data. I used this data with the data layers to create Figures 1 to 3 and 5 to 8 and also Table 1.

Data Sources:
MassGIS, 2000 Census

Projected Coordinate System: NAD 1983 State Plane Massachusetts Mainland FIPS 2001 (Meters)
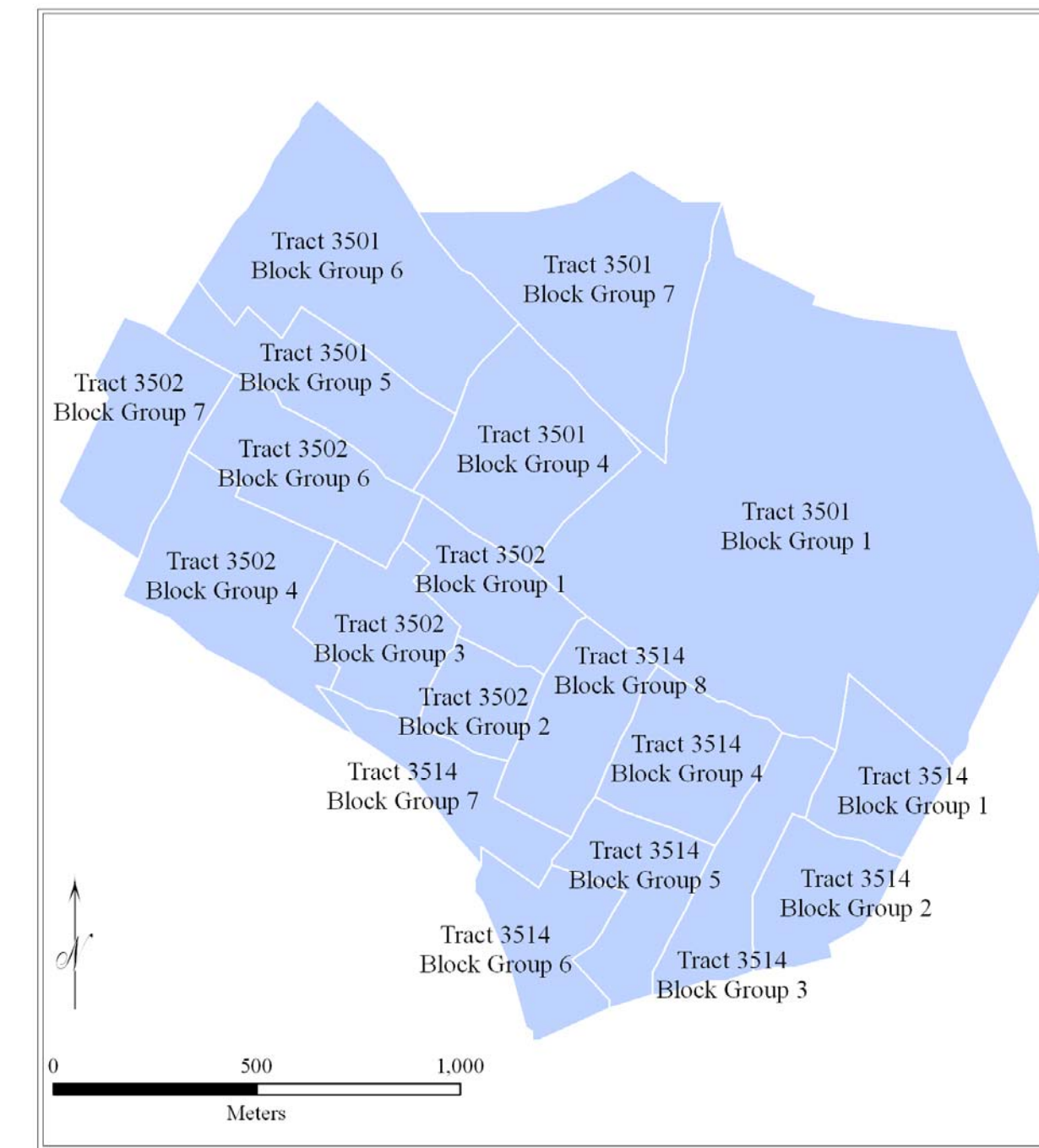

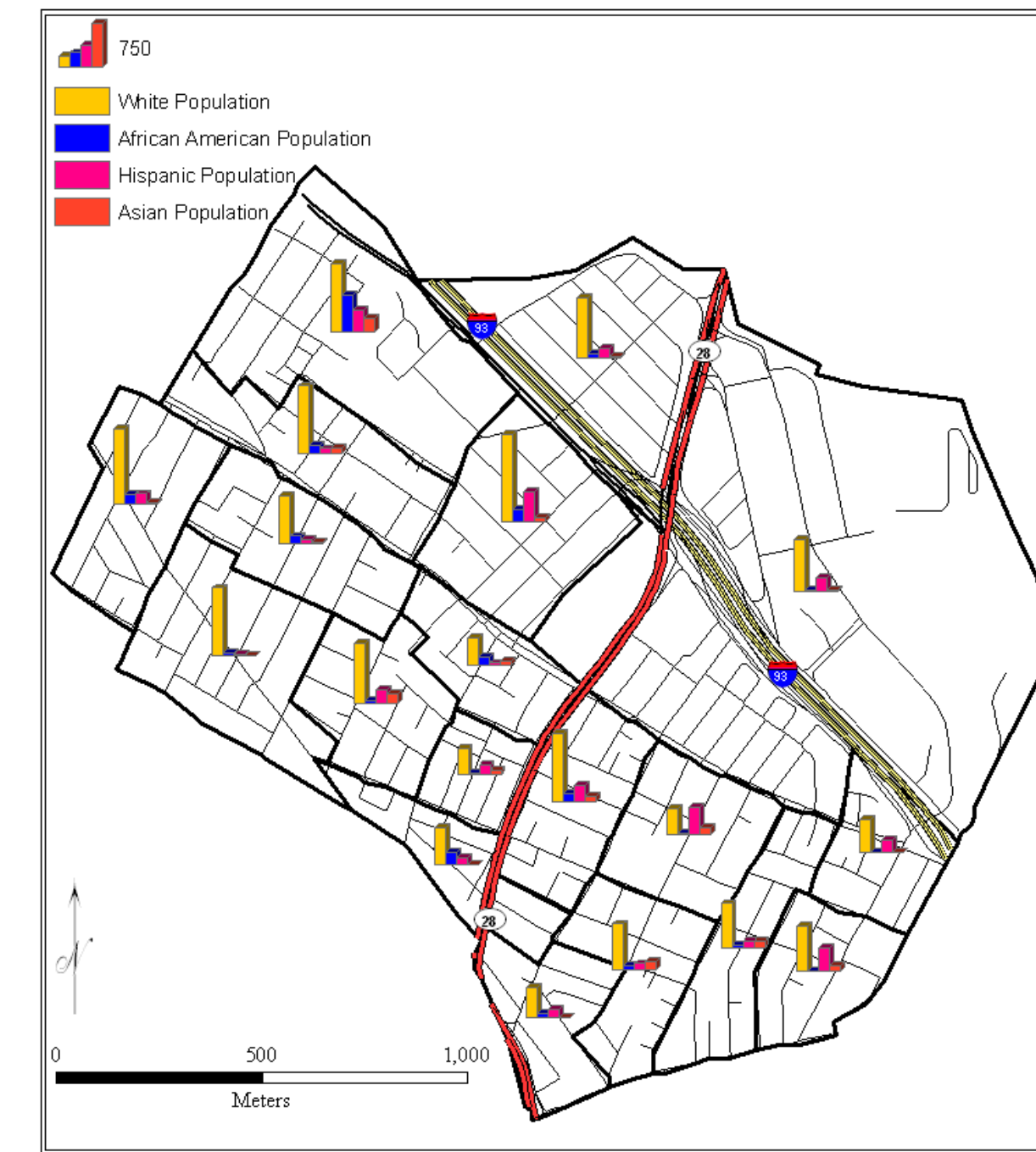**Figure 4:** General map of study area. Tract and block group designations taken from 2000 Census.

Figure 5: Map of the population for each block group by race. This data is from the **population_by_race.dbf** file on the MassGIS website.

Results:

According to the 2000 Census data, people in the study area are more likely to have a low income, no schooling, live below the poverty line, not be homeowners, are minorities, or are not U.S. citizens than in Massachusetts. However, I did not find a correlation between the study areas and their distance from Interstate 93.
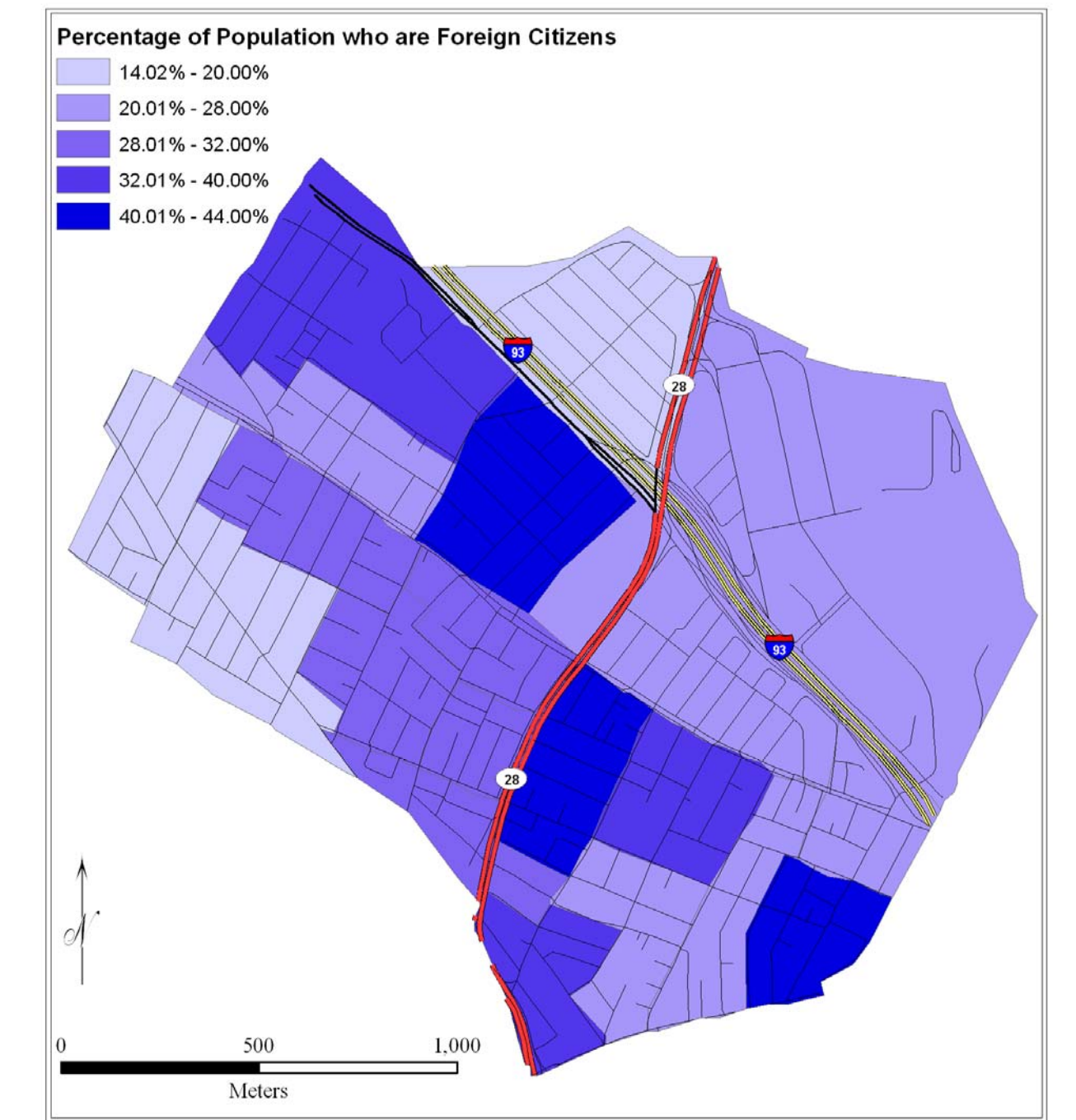
Conclusions:

Overall, most of the block groups qualified as an environmental justice population. An environmental justice population has either a minority or foreign population greater than 25%, an average income of less than $30,515, or less than 75% of the population is proficient in English. Only block group 7 of Tract 3501 and block group 4 of Tract 3502 did not qualify. However the SES data did not vary in the about 1.5 kilometer radius that I examined. Table 1 has the results from some of the block groups. The ones I included were the ones which either had the highest value for a field or were the closest to the highway. The block groups nearest the interstate never had the highest value. In fact, they were usually below average for the study area. The SES data of the community does not seem to be related to distance from the highway. I studied 19 block groups for my project. For the data I used, block groups were the smallest set of data available. My recommendations for similar projects is either to use more specific data, like on a block by block basis, or a larger study area.

Figure 6: Map of the percentage of the population who are not U.S. citizens. This data for this map is from the **legattrib.dbf** file on the MassGIS website.
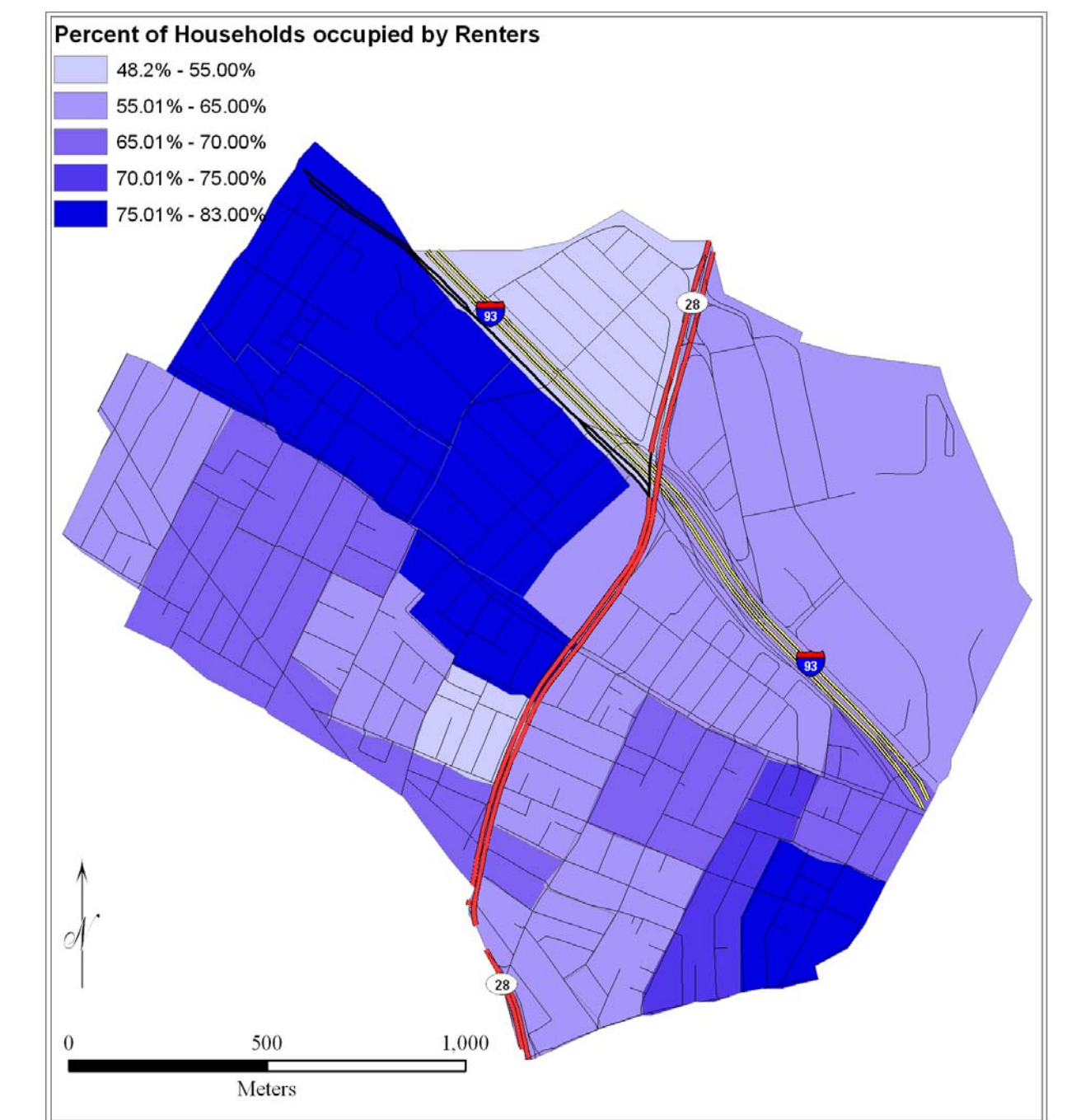

Figure 7: Map of the percentage of occupied households which were occupied by renters in 2000. The data to create this map is from the **legattrib.dbf** file on MassGIS.
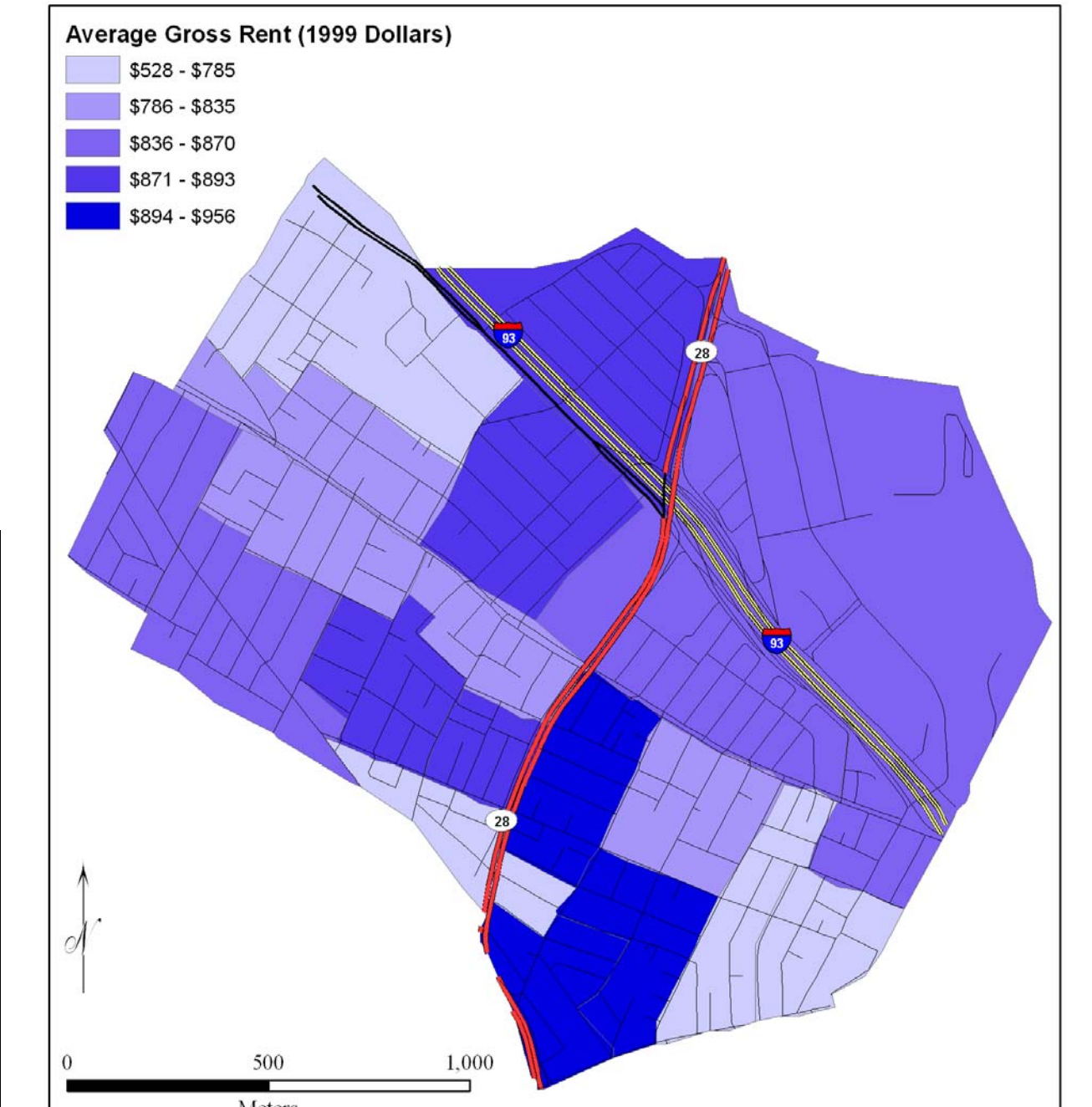

Figure 8: Map of the average gross rent for each region. This data was from the **legattrib.dbf** file on the MassGIS website.

	Block Group	Percent Minority	Percent below Poverty Level	Percent of Males over 25 with No Schooling	Percent Foreign	Percent Renters	Minimum Distance to 93
Tract 3501	1	36.22%	5.54%	10.61%	25.72%	59.16%	0 meters
	6	27.05%	27.77%	1.00%	33.61%	81.29%	50 meters
	7	22.72%	15.85%	0.00%	15.64%	48.20%	0 meters
Tract 3514	1	38.85%	11.37%	3.52%	20.33%	67.32%	0 meters
	2	55.56%	15.28%	9.40%	43.52%	82.64%	250 meters
	4	67.64%	18.68%	8.08%	39.95%	68.13%	215 meters
	8	42.85%	11.72%	17.45%	41.85%	56.15%	400 meters
Average		39.37%	13.87%	4.61%	29.52%	66.04%	381 meters

Table 1: This table shows the data from all of the figures, but not all of the block groups are represented. Only block groups with either the highest value for the field (highlighted in yellow) or contain Interstate 93 in their boundaries (highlighted in teal) are in the table. The values for this table were from the **legattrib.dbf**, **education_attainment_by_gender_age.dbf**, and **income_poverty_levels_by_age.dbf** files on MassGIS.