

Spatial Analysis of Furman Freshman for the Classes of 2002 and 2003 using GIS

By Siobhan Scott

Introduction

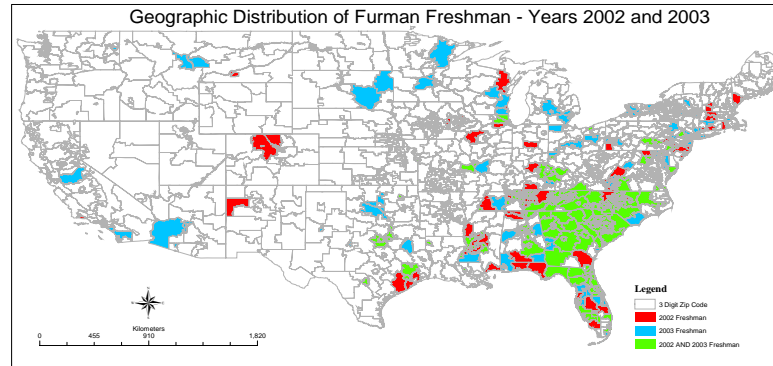
The purpose of the project was to map the geographic distribution of Furman freshman at Furman for the academic years of 2002-2003 and 2003-2004. My objective is to determine if there are any spatial patterns in the distribution of total freshman each year, as well as, the distribution by sex and ethnicity. With this data, hopefully Furman administration will be able to better target their recruiting efforts to make the campus more diverse geographically and ethnically.

Hypothesis

I hypothesized that there would be no major changes between each year (2002 and 2003) and that the majority of Furman Freshman from each year would be Caucasian Females from the same zip code areas. This is based on my observations around Furman campus.

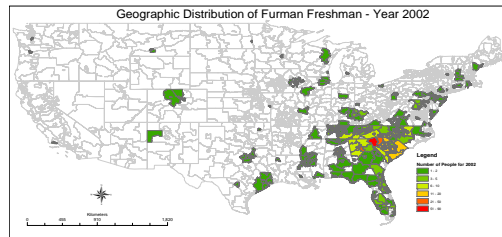
Materials and Methods

Microsoft Excel files containing student's 5-digit home zip codes, sex, and ethnicity were obtained for the freshman years of 2002 and 2003. The data was geocoded with respect to zip code and then converted to 3-digit zip codes. When there were more than one student from the same zip code, they were combined into a single category. Each 3-digit zip code category contained the number of each sex and ethnicity. This data was then brought into ArcMap for further visualization and spatial analysis.

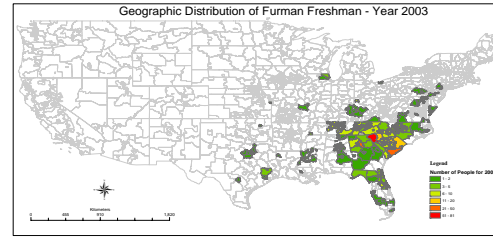


Map 1: The above map demonstrates the geographic distribution of Furman Freshman based on their 3-digit home zip codes for the Academic Years of 2002-2003 and 2003-2004.

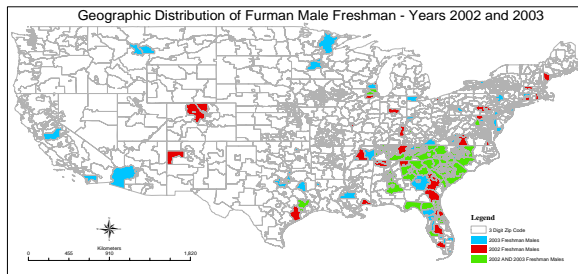
Numbers for Freshman Classes 2002 and 2003				
	Class of 2002		Class of 2003	
	Number	Percentage	Number	Percentage
TOTAL	224		241	
MALE	100	45%	107	44%
FEMALE	124	55%	134	56%
ASIANS	7	4%	14	7%
BLACKS	15	6%	15	8%
WHITE	158	73%	168	70%
BI-RACIAL	5	3%	6	3%
MEXICAN	1	1%	0	0%
HISPANIC	10	5%	7	3%
OTHER	1	1%	2	1%
UNKNOWN	14	7%	19	8%



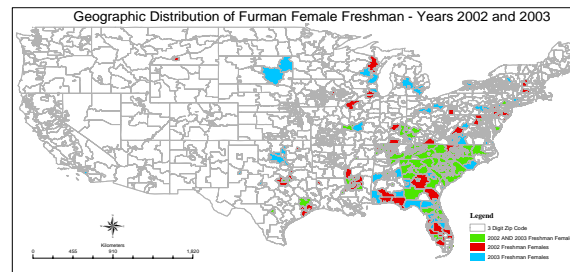
Map 2: The above map demonstrates the number of freshman from each 3-digit home zip code for the year 2002



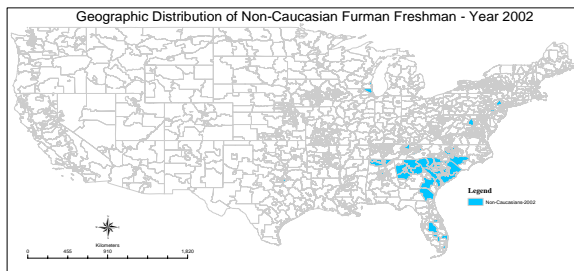
Map 3: The above map demonstrates the number of freshman from each 3-digit home zip code for the year 2003



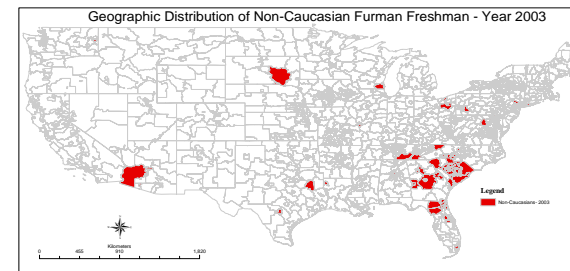
Map 4: The above map demonstrates the geographic distribution of Furman Male Freshman based on their 3-digit home zip codes for the Academic Years of 2002-2003 and 2003-2004.



Map 5: The above map demonstrates the geographic distribution of Furman Female Freshman based on their 3-digit home zip codes for the Academic Years of 2002-2003 and 2003-2004.



Map 6: The above map demonstrates the geographic distribution of Non-Caucasian Furman Freshman based on their 3-digit home zip codes for the Academic Year of 2002-2003.

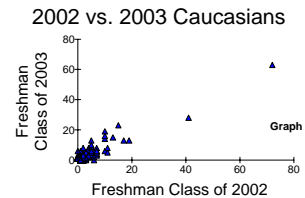
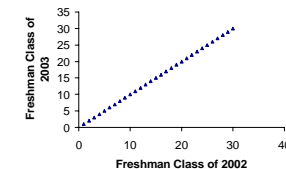


Map 7: The above map demonstrates the geographic distribution of Non-Caucasian Furman Freshman based on their 3-digit home zip codes for the Academic Year of 2003-2004.

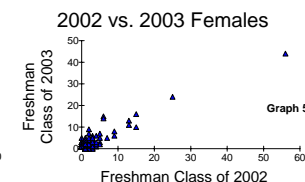
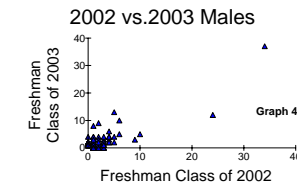
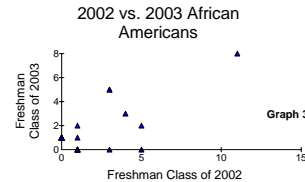
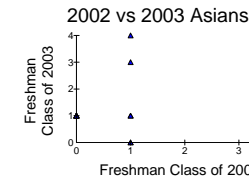
Results

It appears that the majority of freshman came from the same 3-digit home zip codes for both the years 2002 and 2003 (Maps 1, 2, and 3). Both Females and males showed this trend (Maps 2 and 3). However, it seems as though males showed a higher number of diverse zip codes (Maps 2 and 3, Graphs 4 and 5). The number of diverse zip codes for non-Caucasians increased dramatically from 2002 and 2003. A few repeated areas were also seen (Maps 4 and 5). The geographic distribution of Caucasians remained very small for both years, there was not much diversity (Graph 1). On the other side, Asians showed little repetition of geographic locations and high diversity (Graph 2). African Americans seemed to show a healthy balance between diversity and repetition of geographic locations for both years. Geographic representation was also examined for Hispanics, Bi-racials, American Indians, Mexican Americans, Other, and Unknown ethnicities, however, there were three or less representations of each of these ethnicities combined for both years and no conclusive results could be made.

Explanation of Graphs



The comparisons are based on 3-digit home zip codes. If a data point falls along the y=x line (as shown in the example plot above), then freshman from both 2002 and 2003 were represented at Furman from that same zip code. Any deviations from the y=x line were zip codes only represented for a single year.



Conclusions

Furman University has a high number of Caucasians coming from repeated areas, efforts need to be taken to diversify their distribution, especially with the females who show the smallest diversity in geographic locations. The increase in diversity of non-Caucasians is growing, this trend should be encouraged, as well as, encouragement of repeated home zip code areas. A healthy university wants both. As few calculations could be made on different non-Caucasian ethnicities, it is clear that efforts should be made to increase their numbers. Furman is a primarily Caucasian school with the majority of students coming from the same 3-digit home zip code locations each year.

Future Goals

It would be interesting to obtain and analyze data from other previous years. This would allow for better trend analysis and prediction of future freshman distribution.

Acknowledgements

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