Life Outside the Bubble: Placing Universities in Physical Context

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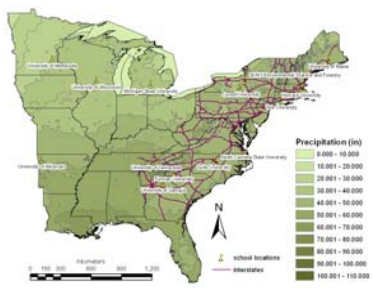
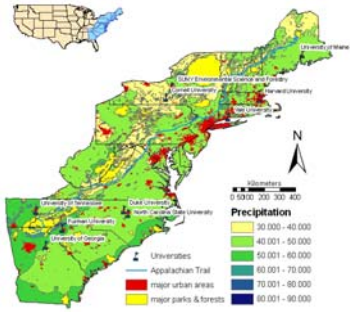
ABSTRACT

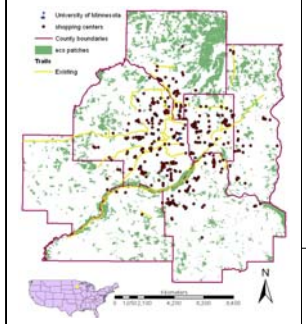
An individual's choice of graduate school often dramatically changes the course of the individual's life. That change comes not only from the resources, faculty, and fellow students at the institution, but also from the opportunities for new and unique experiences provided by the school's surroundings. However, finding information about and exploring those contextual resources often proves more difficult than locating facts and figures about the physical, financial and human resources of a university itself. While a host of guidebooks provide easy access to that information, those same sources often gloss over in a brief paragraph the surrounding environs where one actually lives a significant portion of his or her life. This project serves as a template for using geographic information systems to address those challenges, and provide a coherent, and easily assimilated view of the resources surrounding universities. To achieve that value, the project focused on the outdoor resources available for recreation and research surrounding 11 graduate schools in the eastern United States offering degrees in forest ecology and Furman University, for reference purposes. From relevant publicly available data, ArcGIS 9.0 was used in a systematic fashion to extract and organized the data pertinent to each individual. The program was then used to produce maps of each area allowing direct comparison of all the schools. The maps indicate the settings of the schools vary widely in climate, ecological heterogeneity, urbanization, and access to public parklands. Using national census data and similar processes, the project could be expanded in the future to produce cultural and socioeconomic contexts as well.

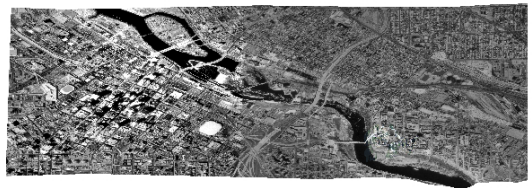


METHODS

An internet search engine, Google, was used to locate publicly accessible data sets, with formats compatible with ArcGIS, describing aspects of the states and towns that support the subject universities. ArcCatalog software was used to preview the data, and check for relevancy. Upon review, the outdoors related data was determined to have greater usefulness, and became the basis for further project work; city specific data was retained, but generally had greater bearing on cultural context, and two schools were dropped from the study due to paucity of data. Data sets including the surroundings of multiple universities and the data sets for the universities with the most replete information were loaded into an ArcMap project to develop the procedures that would later be applied to each university. The symbology for the layers in the ArcMap project was adjusted, and the projections for some data layers were defined to facilitate work with the data. An additional layer consisting simply of the location of each school was created and added to the project. The buffering tool was then used to create layers of circles with different radii centered on the universities. Those buffer layers were then intersected with some of the outdoors resources layers to determine the resources available within a certain distance of each institution. Next, the select by attributes and clipping functions were used to produce layers consisting of the surroundings of individual universities. For each school, the newly produced layers pertinent to that particular school were added into a new ArcMap project for that school. Where digital elevation models (DEM) were available, 3-D analyst tools were used to produce triangulated irregular networks (TIN) for the overlay of remotely sensed images in ArcScene. Symbology was optimized, and maps were produced for each ArcMap project.





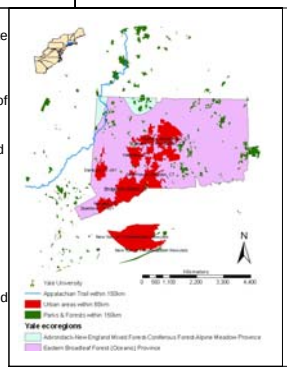


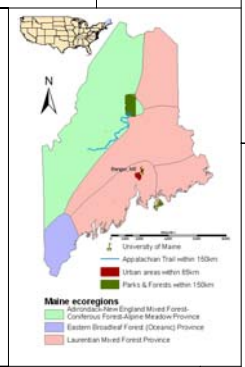
Digital quarter quadrangle photograph of downtown Minneapolis, MN. The University of Minnesota is next to the river in the lower right.

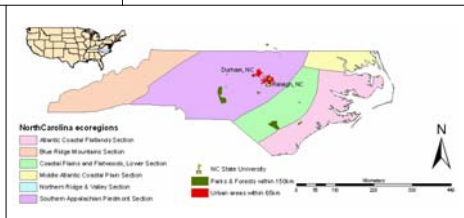
RESULTS/DISCUSSION

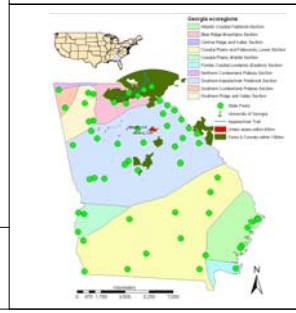
Two maps of the eastern United States, twelve state maps with data pertaining to specific universities, a county map for one university, two relief maps of local terrain with overlaid aerial photographs, and one summary table were produced within a series of ArcMap and ArcScene projects.

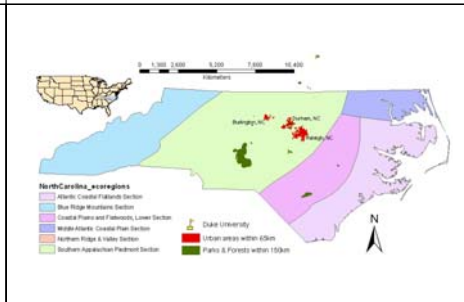
Despite the fact that all of the institutions examined in this study reside in the eastern United States and all offer degrees in forest ecology, except the reference school Furman University, significant differences exist in the natural settings of the schools. Annual precipitation ranges from 27.5" at the University of Minnesota to twice that figure at Furman University. Similarly, urbanization around the schools ranged extensively from minimal at the University of Maine to wide spread at Harvard and Yale. Interestingly, the area of parks and forests did not show a strong inverse correlation with urban area; the University of Tennessee lies within above average urbanization, but has the most extensive public land in the vicinity of any of the schools examined. Additionally, the environs of the University of Maine contain both little urbanization, and little park land. Much of that information could have been gleaned from summary statistics, but the maps also reveal the spatial patterns of those outdoor resources. The settings of the schools varied in both degree of clustering of park areas and heterogeneity of ecoregions. In general, fewer ecoregions exist in the vicinity of the schools located closest to the coast. The limited TIN analysis also indicated substantial variation in local environment with Yale having a much more complex topographic setting than the University of Minnesota. Overall, Yale and Harvard appear to have the fewest natural resources while Furman, the University of Tennessee, and the University of Georgia have the richest surroundings.

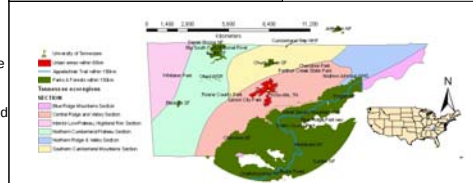


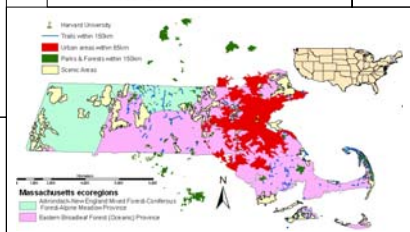


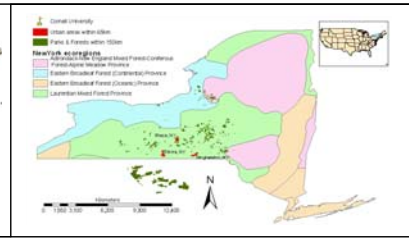


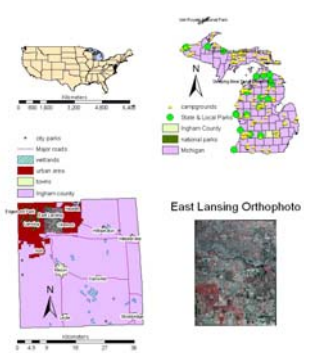












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ACKNOWLEDGEMENTS

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APPLICATIONS and FURTHER STUDIES

Cultural and socioeconomic resources represent a natural extension of this project. The national census provides much of the necessary data for analyzing the civil settings that college towns produce. Additional information for understanding the human context of schools may originate with city governments. Regardless of which particular data sources are chosen, future studies should determine their sources of data and have clear goals and means of evaluation prior to beginning the research to avoid many of the obstacles encountered in this project.

While conceived of as an aid for graduating college seniors, a high school senior could just as easily use this project to help choose an undergraduate institution to attend. Even a student who has already chosen schools to visit could use this information to optimize campus visits. More generally, analogous procedures could be used in planning vacations or even as the basis for a travel agency. Inverting the process, universities could use the information to highlight the advantages the school's location offers, and thus gain a major recruiting tool.