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## Information Technology at NYU



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### Exploring GIS: A Student's Experience

By **Benita Liao**

My introduction to Geographical Information Systems (GIS) began this past July, when I started working with Drs. Michael Marmor and Phillipe Nyambi of NYU's School of Medicine on a study of the transmission of HIV/AIDS in Cameroon. My job was to plot information on maps about the villages that were being studied and the spread of HIV/AIDS in the area, so that various patterns might be recognized. I knew nothing about GIS before taking this job, so although I knew what the eventual goal of my project was, I had no idea as to how I could achieve it.

On my first day, I walked into the ITS Third Avenue North computer lab resigning myself to the fact that I was going to be spending a good part of my summer indoors and underground. I was introduced to GIS by Frank LoPresti, head of the ITS Social Sciences, Statistics & Mapping Group, who signed me up for two online classes offered by the ESRI virtual campus. (1)

ESRI is the company that makes ArcGIS, the mapping program that I was going to use. To my surprise, they offered upwards of fifty different types of online courses. Even more surprising to me was the fact that every time I signed onto the virtual campus website, a little counter on the right side of the screen told me that over 200,000 users from 180 countries were currently using the program. I had no idea that Mapping was such a large field. In actuality, programs such as ArcGIS are used daily by researchers in the health field to chart the spread of diseases, by marketing researchers to map out the location of a product's customer base, and by police officials to target crime-heavy areas, among innumerable other uses.

To familiarize myself with ArcGIS, I took two introductory ESRI classes: Creating, Editing, and Managing Geodatabases for ArcGIS 8.2 and Working with Rasters in ArcGIS. Having never taken an online class before, I did not know what to expect. As it turns out, the information I learned was useful and interesting, but I had trouble staying focused for hours at a time.

At the end of each lesson, I was assigned an exercise to complete in ArcMap and ArcCatalog, two of the many components of ArcGIS. Although these exercises were the key to actually learning the software, they were frustrating at times. For example, sometimes I would carefully follow their instructions point by point, but I simply could not generate the intended map. Thus, a drawback to using these online classes alone is that they do not provide an online teacher who can assist you when you encounter trouble.

Once I had completed these courses and learned the basics of ArcGIS, I was sent to websites that provided free GIS data for different parts of the map, such as boundary lines (for countries), roads, railroads, populated places, etc. There, I was able to download the data for Cameroon and all of its surrounding countries.

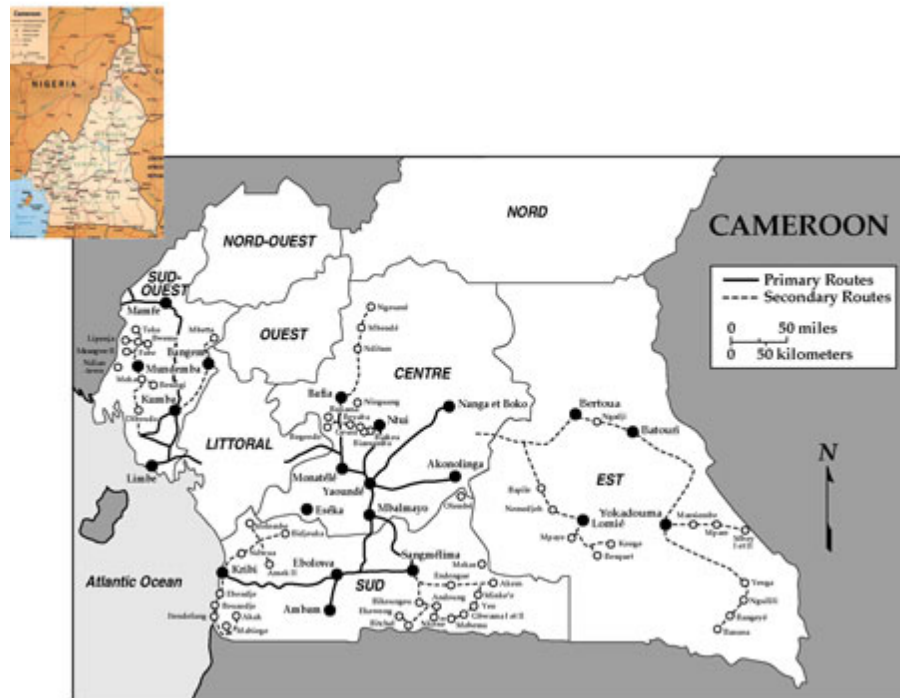


Figure 1. A map of Cameroon created without the benefit of GIS. (2)

However, what I thought was going to be a simple "download and open file" routine became the first major headache on my road to learning GIS. Although I had downloaded all the necessary files, the files were not in a format that was compatible with ArcMap version 8.3. I quickly learned about a handy resource: I called ESRI's help line and this issue, which I spent hours agonizing over, was solved in less than thirty minutes.

During this time, I also read books and magazines about GIS to learn more about the program I was using and the field in general. In many of those publications, I read that color usage was a very important part of GIS. I never understood that statement until I started to assemble and make a map myself. After adding layer after layer to my map (each part of the map is called a layer; for example, in my map, there was one layer for all the village names, one for the rivers, and so on), I found it very difficult to make the symbols distinct from each other with the colors that were automatically provided by the computer program. I ended up spending days strategizing and experimenting to find the clearest and most effective way to present the data on the map.

Over the course of the summer, it seemed that each time I mastered one part of the program, another would instantly cause me trouble. On many occasions, I turned to the ArcGIS help guide that is provided as part of the program. However, to my

disappointment, I found that often the explanation included too many technical words, or I simply was not able to find an answer to my question.

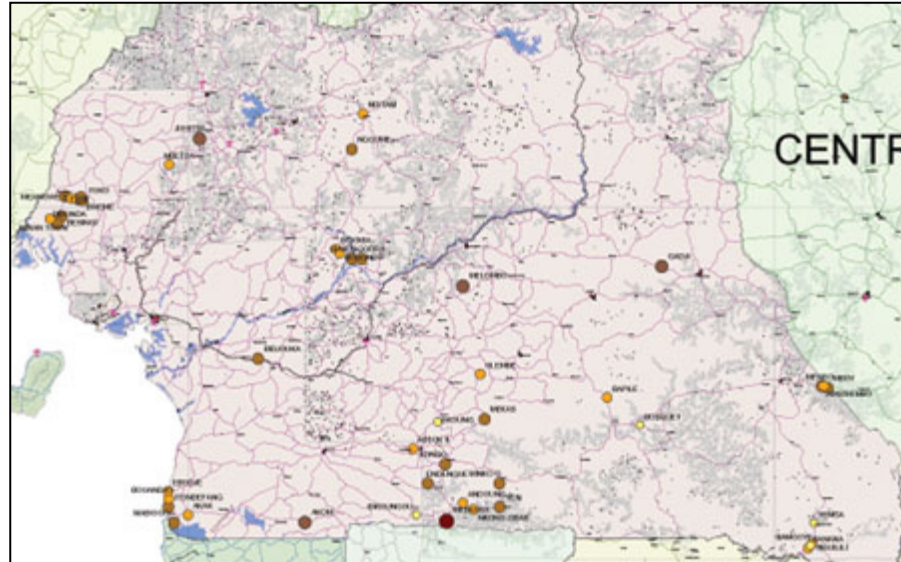


Figure 2. A detail-rich map of Cameroon created by the author using ArcGIS.

I soon realized that the best way for me to learn this software was simply to "play" with it: to click each button in the toolbar and see what it did and to be intrepid in investigating its menus and options. As the summer came to a close, I couldn't believe how much of the software I had learned.

Although the villages of Cameroon we were working with in this project had been plotted before in a previous paper, it was not done using GIS, and thus the map was not very precise (compare Figures 1 and 2). Using GIS, we were not only able to plot the villages with varying percentages of HIV prevalence, but also to represent other variables, such as strains of HIV, on the map. While there is always more to learn, I have found through this experience that with GIS, it is possible for even a beginner to create a clear, useful map.

1. ESRI Virtual Campus: <http://campus.esri.com/>
2. Nyambi P, Zekeng L, Kenfack H, Tongo M, Nanfack A, Nkombe I, Ndonko I, Shang J, Burda S, Mbah H, Agyingi L, Zhong P, Nadas A, Zolla-Pazner S, Marmor M. Human immunodeficiency virus infection in rural villages of Cameroon. *J Acq Immune Deficiency Syndr* 2002; 31:506-513.

### Author Biography

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