



## **Teaching GIS Technology at UW-Superior**

Volume 9, Number 8: May 23, 2003

William Bajjali

University of Wisconsin, department of Biology and Earth Science, Superior, WI 54880

### **Abstract**

As educators, it is our responsibility to continually examine the curriculum of our educational system. Specifically, we need to regularly modify our curricula in order to include subjects related to the technology used extensively in our society and to train and educate our students to use this technology. This approach will facilitate the transfer of students moving from the environment of education to work force environments.

## **GIS Program at UWS**

The University of Wisconsin-Superior started recently to move in this direction by offering the GIS minor to serve existing specialties. GIS stands for Geographic Information System, and it is purely technology-related.

### **GIS Definition**

Because GIS is used extensively in different disciplines and industries, its definition is very broad and mainly depends on the type of user. In general, GIS is a computer-based system capable of creating color-coded maps based on diverse types of data. GIS is a combination of hardware, software, database, and user expertise. The users who run the GIS play a major role in operating the technology. Users have the ability and knowledge to run the system and to manipulate the database using functions that are based on advance math and statistic analysis. GIS can support many areas of work and provide the ability to collect and manage large volumes of complex spatially-referenced data, which can then be used to study in greater detail some of the issues of concern. The GIS can create a new product that uncovers hidden relationships; it can associate information with features on a map that can answer questions and solve many problems.

### **GIS Applications**

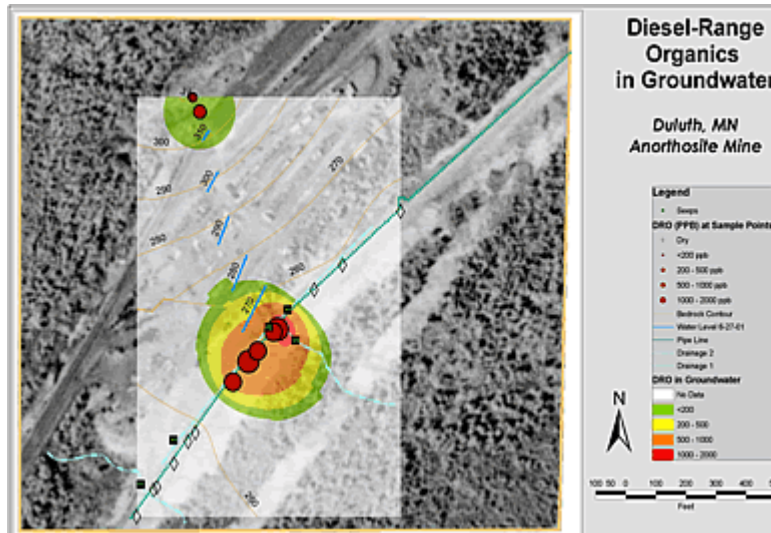
Of the almost one million professionals using GIS all over the world, approximately 50% resides in the United States. The market demand for people with a GIS background around the world continues to increase dramatically. The growing need for GIS technology encouraged the Biology and Earth Science Department at UW-Superior to create a GIS minor and a GIS certificate for professionals in the community who are looking to upgrade their skills in GIS.

The role of UW-Superior is particularly important, because it will prepare the students not only to master the technology but to use it in a variety of disciplines, such as biology, geology, hydrogeology, economy, transportation, education, and social science.

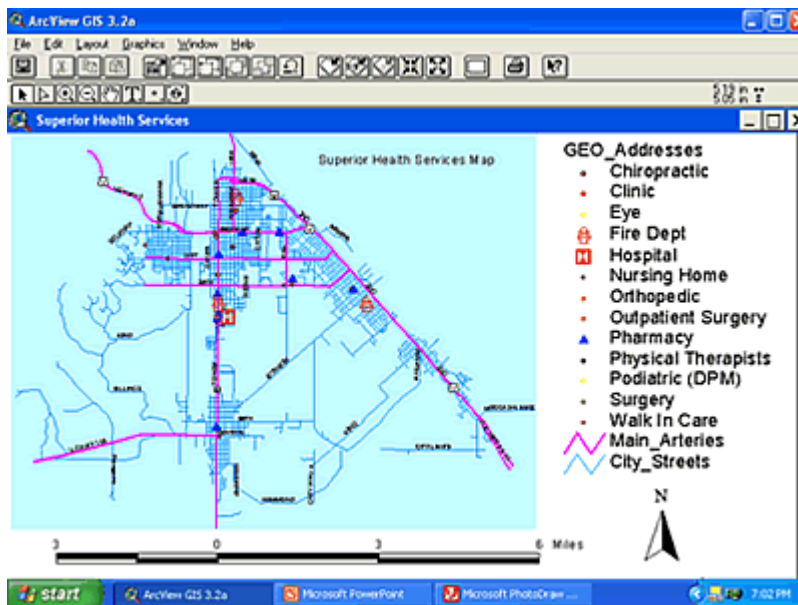
The GIS minor consists of four courses that cover the principles of Geographic Information Systems and remote sensing. It also introduces the students to the most modern and advanced GIS software on the market. UW-Superior's GIS lab is equipped with 16 advanced computers, printers, digitizers, and one plotter.

The four courses introduce the students to the whole GIS process and its functionality. In each course, the students should complete a real world project. Since fall 2001, UW-Superior students have carried out many projects, which they are required to present to the entire class. For their projects, we ask students to contact a faculty member from their own program or from other institutions, such as the Wisconsin Department of Natural Resources, the U.S. Geological Survey, or local organizations to acquire an actual database. The collected data will essentially be used in their projects.

The projects carried out by students are diverse and reflect different problems in various disciplines. Some of the projects are multidisciplinary and required more than one student to be involved. Examples of student work, along with additional information, can be found on my [web page](#). The figures below demonstrate a few of the projects carried out by our students.



**Figure 1. Hydrocarbon contamination in Duluth, MN.**



**Figure 2. Medical management in Superior, WI.**

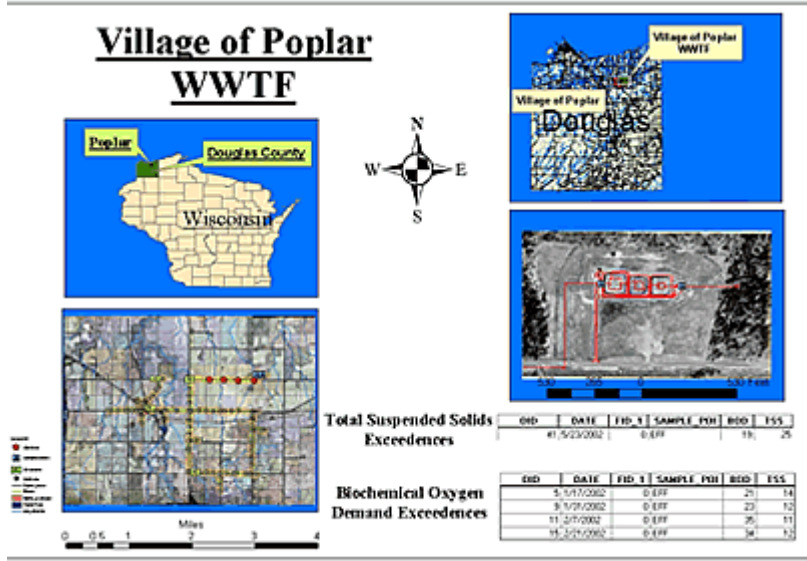


Figure 3. Managing waste water treatment in the village of Poplar, WI.



Figure 4. Wolf Pack Locations in Northern Wisconsin.

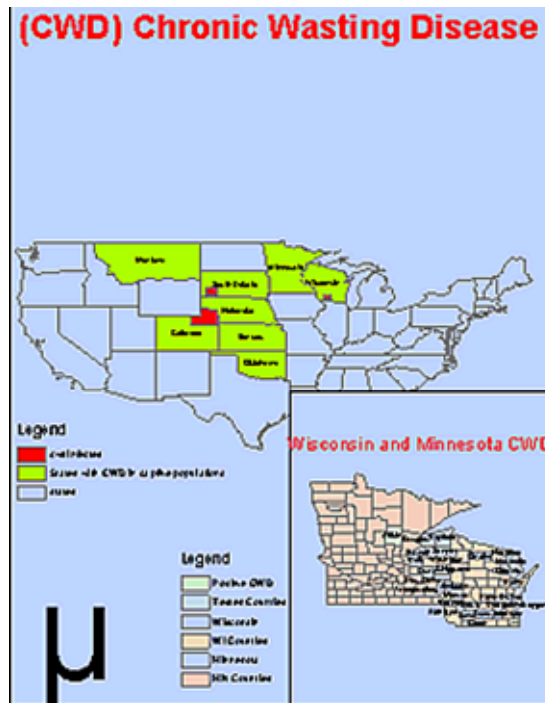


Figure 5. Distribution of Chronic Wasting Disease in the United States.

## Species Distribution



Figure 6. Distribution of Tree Species at the UW-Superior.

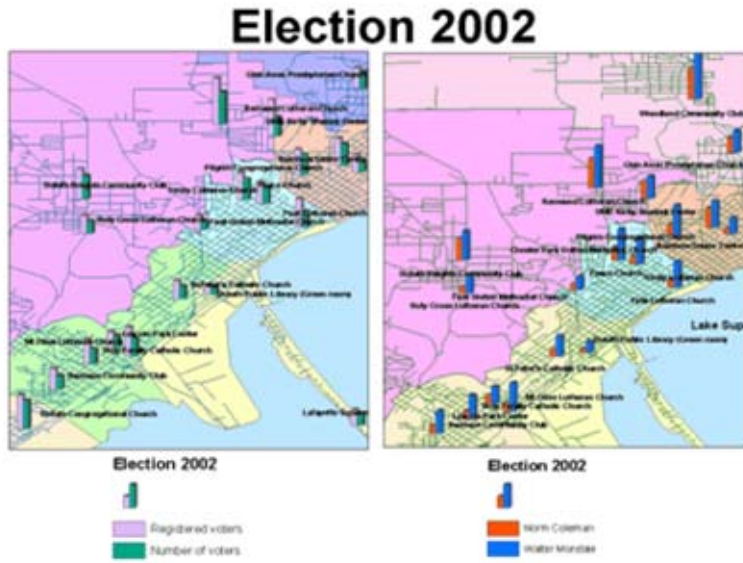


Figure 7. 2002 U.S. Senate election results in Duluth area.

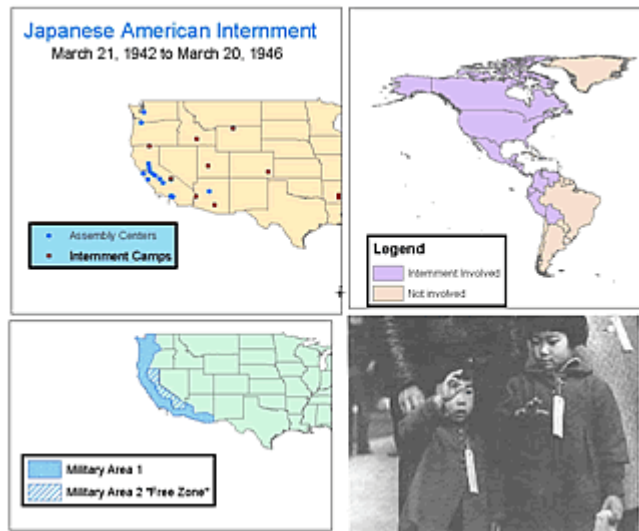


Figure 9. Japanese American Internment (March, 1942 - March 1946).