Proposal for the Use of the FY2001 Technology Fee

Submitting Organization(s): Anthropology and Geography

Contact Person (Name, email phone): Zhi-Yong Yin, gegzyy@panther.gsu.edu, 1-1826

1. Executive Summary

This project will have a university-wide impact. More than 2,000 students are currently enrolled each year in the courses that will benefit from this project, with an additional increase in enrollment of 40-50 students per year. With more exposure of GIS technology to non-majors in those lower-division classes, it will enhance the image of our department as a strong regional participant in GIS and IT industries and bring us more undergraduate majors and graduate students. The project requires minimal physical modification of the classrooms and effectively applies the Technology Fees to improve the learning environment for students. Additionally, it will offer a long-lasting influence on both undergraduate and graduate programs in Geography and Anthropology and our students will be better prepared for the needs of the current and future job market.

---

### 25 Word Project Description

<table>
<thead>
<tr>
<th>25 Word Project Description</th>
<th>One-time Costs</th>
<th>Ongoing Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expansion of Instructional Lab GIS</td>
<td>$49,970.00</td>
<td>$24,375.00</td>
</tr>
</tbody>
</table>

2. Project Description

Geographic information systems (GIS) has become the focal point of employment for geography majors and graduate students. The federal initiative of the Internet-based Digital Earth demonstrates the importance of GIS. In 1998, Vice President Al Gore introduced the concept of Digital Earth based on geo-referenced databases with a wide variety of applications from education to crime-fighting. The targeted audience will be the citizenry as a whole rather than the trained professionals. An Inter-Agency Working Group has been created for the project (www.digitalearth.gov), including NASA, USGS, NOAA, NSF, EPA, NIMA, FGDC, and the Army Corps of Engineers. On the other hand, OpenGIS Consortium, an organization of GIS and information technology (IT) industry leaders and research universities (www.openGIS.org), estimated that 80% of all data in business databases are spatially referenced. Therefore, GIS can make significant contributions to day-to-day operations of business enterprises of all levels. Numerous positions are opening daily with requirements in GIS experience in government agencies and private sector, including environmental, civil engineering, and IT industries (www.gjc.org). Of the 40-50 graduate students in the geography M.A. program, for example, more than 2/3 have expressed their intention working in GIS-related projects. With multi-faceted applications for GIS and rapid development of the IT industry, there is a trend of integrating GIS, remote sensing/imagery processing technology, and global positioning systems (GPS), which will further enhance the growth of the field. It is necessary for students to be prepared for this in the market place. Techniques of Internet-based geographic visualization (GVis) can broadcast and display large spatial datasets effectively. For example, animation and Internet broadcast can help the rendering of spatial and temporal characteristics of various events, such as the Federal Disaster Declaration areas (www.msu.edu/~halldenj/fema), quickly to a large audience. With millions of maps delivered via the Internet, people who only have access to paper maps become disfranchised. Retrieving and critiquing Internet maps will be the necessary skills for everyone. Therefore, training in GIS, cartography, and GVis will not only benefit geography students, but also students from other programs, such as anthropology, sociology, political science, geology, environmental studies, business management, marketing, and policy studies.

Currently there are 15 well-equipped PCs, 2 printers, a color scanner, and a PC projector exclusively for instructional uses in the existing instructional lab. A website will be designated for the lab on the departmental web server. The University System has the site license for ESRI GIS products. We are equipped with most commercial GIS, digital image processing, graphics, and statistical analysis software packages. We have cumulated a substantial amount of data over the years, including census and other socio-economic data, digital elevation data, digital satellite images and aerial photographs. We also have the faculty and staff who have the expertise in GIS.

The current lab and facility in the department cannot satisfy the demand of an expanded curriculum in GIS education. The Anthropology/Geography graduate student office can be converted into an instructional lab, with a
40% increase in space (from 690 ft² to 970 ft²) and minimal physical alteration of the rooms. The proposal also requests the purchase of additional hardware and software to equip the increased space. Plans have been made to incorporate GIS education into lower-division classes, such as Geog 1101 (Introduction to Human Geography) and Geog 1113 (Introduction to Landforms). A standard lecture will be provided to each instructor and at least two 2-hour labs will be designed for the lower-division geography classes. Additionally, it is highly desirable for students in Geog 1112 (Introduction to Weather and Climate) to have access to real-time weather maps and satellite images, which requires fast network connection. The capability of receiving real-time spatial data will also enhance the potential of teaching in the fields of disaster assessment, emergency planning and management, urban traffic control, air pollution studies, and natural hazards management.

3. Relevance to Regents Guidelines

The proposed project is strictly in compliance with the Board of Regents guidelines for the use of technology fees, including providing hardware and discipline specific software, expansion of network connectivity, enhancing training for the GIS and IT industries, and significant improvement of the learning environment for a large number of students. The project will be supported by faculty and staff members of various background, provide service to more than 2000 students per year, and involves minimal physical alteration of space.

Courses and the number of students impacted include:

Geog 1101 Introduction to Human Geography
Enrollment: 400-500 students/year (including summer).

Geog 1112 Introduction to Weather & Climate
Enrollment: 600-700 students/year (including summer).

Geog 1113 Introduction to Landforms
Enrollment: 500-600 students/year (including summer).

Anth 2230 Introduction to Archaeology
Enrollment: 40-50 students/year.

Pers 2001/2002 Perspective/Scientific Perspective
Enrollment: 100-120 students/year.

These are the lower-division classes that will be benefited by the new lab. Among them, Geog 1101, 1112, 1113 and Pers 2001-2001 are part of the Core. The use of the lab includes class demonstrations using GIS technology to solve real-world problems, such as urban and regional planning, demographic characterization, environmental and natural resources management, and hands-on labs of integration and analysis of data from Internet sources.

Geog 4520/6520 Quantitative Spatial Analysis
Geog 4522/6522 Thematic Cartography
Geog 4524/6524 Map Design
Geog 4526/6526 Automated Cartographic Production
Geog 4528/6528 Mapping Fundamentals for Geographic Information Systems
Geog 4530/6530 Introduction to Remote Sensing
Geog 4532/6532 Geographic Information Systems
Geog 4534/6534 Advanced Geographic Information Systems

These are the geotechnology courses, forming the core of the geography undergraduate and graduate programs. In each semester, we offer 2-3 courses from this list. At the current time, the enrollment is limited by the classroom size (22 seats) and we are running unmet demands for both undergraduate and graduate components. The expansion of the classroom will solve the problem. Current enrollment: 130 students/year (including summer). Potential increases in enrollment: 40-50/year.

Geog 4640/6640 Geomorphology
Geog 4650/6650 Applied Hydrology

These courses are offered on an annual basis. Both have labs designed to use GIS technology to perform terrain/drainage analysis. At this moment, we have to teach the labs in two shifts and in many cases have conflicts with other courses that use the same classroom. Current enrollment: 40-50 students/year.

Anth 4440/6440 Epidemiology and Anthropology
Anth 4620/6620 Quantitative Methods in Anthropology

These new courses will deal with issues of large spatial datasets in anthropology. GIS and mapping will be helpful in analysis and visualization of results. Estimated enrollment: 40-50 students/year.

Geog 8030 Seminar in Cartography
4. Justification of One-time Funding Requirements

The following budget is for the purpose to convert the existing space into a larger instructional lab, with additional hardware and software, and expanded network connectivity. It also includes the initiation of institutional membership of a national GIS education organization (UCGIS, www.UCGIS.org), a consortium of universities with significant GIS activities, which offers a variety of benefits, including access to developing technical standards and resources in teaching, job opportunities and contacts for students, and participating in publications and conferences.

1. Equipment: 15 PC with PIII 800 or higher processors, 256 MB memory, 30 GB hard drive, 19” monitor, zip drive (@ $2,500 each), and a network printer (@ $2,000) - $39,500.00.
2. Networking (Network connections and wiring for the new classroom) - $4,000.00 (estimated).
3. Initiation of UCGIS membership - $3,000.
4. Furniture for the expended lab (8 computer tables @$140 each, and 15 chairs @$90 each) - $2,470.00.

Subtotal: $48,970.00

5. Continuing Funding Requirements

1. Site license and software update: We will need the current version of ERDAS Imagine every three years ($1,500/3) and maintain the site/multiple licenses of other software packages, such as Macromedia Freehand and Flash, Avenza MapPublisher, VistaPro, Golden Software MapViewer and Surfer, Micrografx Designer, and Adobe Photoshop ($2,000/year) - $2,500/year.
2. Annual membership of UCGIS: - $1,000/year.
3. A GRA for maintaining the webpage for instructional use and assisting the lab manager in system and network administration - $8,000/year.
4. Training of the technical staff - $2,500/year.
5. Replacement of hardware: For 15 PCs with 4 years of lifetime - $9,375/year (15*$2,500/4).

Subtotal $24,375.00

6. Accountability of Funds

Most one-time funding will be used to purchase hardware and software for the new lab. It is possible to setup a designated account in the departmental budget to administer the use of the continuous funding.

7. Additional Funding Required, Non-Technology Fee

To convert the new space into a classroom, a white board and projector screen need to be added with a cost of $1,000.00 (estimated).

8. Impact on Computing/Network Infrastructure

The department maintains its own web server and data servers. We offer network storage for student projects and faculty research. The project should not put significant strain on the University computing/network infrastructure.