Geographic Information Systems, Global Positioning Systems, and Spatial Analysis Tools in Support of Service Learning Content

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Tennessee State University
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- Historically Black College – 8,000 students
- Offers only Geography minor –
  No students minor in Geography
- Geography courses primarily taught to fulfill pre-service teacher requirements
- No visible use of Geographic Information Systems in teaching or research

GIS Capacity Development at TSU
Fall 1999-Summer 2000

- **USDA 1890 HBCU Capacity Building Grant** funds used to launch Geographic Information Sciences (GISc) Laboratory
- **NASA Center for Automated Space Sciences (CASS)** program funds become available to support several undergraduate student researchers and expand the GISc Lab.
- **GISc Lab** formally established during summer 2000 with seven undergraduate student researchers on staff.

GISc Lab Urban/Environmental Studies Service Learning Development Fall 2001 - Present

- **Massie Chair of Excellence in Environmental Science and NASA Center for Automated Space Sciences (CASS)** programs provide funding for GIS hardware and software and support for several undergraduate research assistants.
- **The GISc Lab** establishes informal working partnerships with Fisk University, Vanderbilt University, Meharry Medical College, the Mayor's Office of Neighborhoods, the Neighborhoods Resource Center, EarthMatters Tennessee, and the Community at Bordeaux.
- **GISc Lab** research assistants and students enrolled in Cartography (GEOG 310) and Urban Geography (GEOG 485) engage in GIS-based environmental/urban studies-based service learning projects…

TSU Upper Division Geography Courses with Geographic Information Systems Content

- **Urban Geography (GEOG 4850) – Course content includes urban GIS applications. An "Urban GIS Term Paper" is required.**
- **Cartography (GEOG 3100) – Course content updated with GIS-based material. Students are required to complete a "hands-on" GIS project.**

Challenge: Many social sciences majors have no background in Geography or GIS.

Classifications and Majors of Students Currently Enrolled in Urban Geography (GEOG 4850) for Spring 2005

Senior	Arts and Sciences
Senior	History
Sophomore	Business Administration
Senior	Arts and Sciences
Senior	Political Science
Senior	History
Senior	English
Senior	Undecided Undergrad
Junior	Business Administration
Sophomore	Biology

Challenge: Incorporating Service Learning Content into an Existing Course

- **Time Constraints**
- **Student Attitudes Towards "Extra Work"**
- **Liability and Safety Issues**
- **"Community Time" vs "Academic Time"**
- **Service Learning vs Community Service**

Challenges Faced in Adding GIS Content to Existing Courses

- Most students enrolled may have no background in Geography or Geographic Information Systems.
- The cost of texts may be a turn-off for students if course is an “elective.”
- The “learning curve” for some faculty members may be somewhat steep.

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Student Urban GIS Term Paper Topics in Urban Geography (GEOG 4850)

- GIS Mapping of Grocery Store Audits vs Local Demographic and Socioeconomic Data
- Impact of a Wal-Mart upon a Smyrna, Tennessee Community
- Comparison of the Demographics of two East Nashville Neighborhoods with Planned "Neighborhood Wal-Marts"
- Spatial Comparison of the Location of Check-Cashing Businesses vs. Full-Service Banks

Student Urban GIS Term Paper Topics in Urban Geography (GEOG 4850) (continued).

- Spatial Location of Abortion Clinics vs Organizations Providing Alternatives to Abortion
- Should Nashville Invest in Expanding its Convention Center?
- Analysis of Land Uses Along a Planned Rev. Dr. Martin Luther King Boulevard Route.
- GPS and GIS Applications in the Development of a Black History/Urban Forestry Educational Walking Trail
- Population Changes Among Immigrant Residents: Nashville, Tennessee 1990-2000

Cartography (GEOG 3100)
Student "Hands On" GIS Projects

- GIS Applications in Assessing the Impacts of an Interstate Highway upon an Historically Significant African American Community in Nashville, Tennessee
- GIS Applications in Determining the Impacts of Toxic Chemical Releases Upon a North Memphis Community
- Spatial Analysis of HIV/AIDS Cases in Washington, DC

Undergraduate Research Topics 2001- 2005

TSU Geographic Information Sciences Lab

- Applications of Geographic Information Systems and Related Technologies in the Analysis of Human/Wildlife Interactions in an Urban Forest
- GIS and GPS Applications in Public Transit Accessibility Assessment
- Development of a GIS Lab to Empower an Environmental Justice Community: Scarboro, Tennessee
- A GPS Data Dictionary to Support Neighborhood Livability Audits and Urban Code Enforcement

Demonstrations of Student GIS Projects in ArcGIS

- Assessing the “Impact Area” for a Local Grassroots Environmental Organization
- Spatial Analysis of HIV/AIDS Cases in Washington, DC
- Spatial Analysis of Public Health Issues in Memphis, TN
- GPS and GIS Applications in the Development of a Black History/Urban Forestry Educational Walking Trail

Website Links

GIS and Spatial Data Resources

- **The U.S. Bureau of the Census American Factfinder (http://factfinder.census.gov/)**
- **The LandView 6 Program (http://www.census.gov/geo/landview/)**
- **TOXMAP at the National Institutes of Health http://toxmap.nlm.nih.gov/toxmap/main/index.jsp**

Online Spatial Environmental/Health Data

- **Scorecard Pollution Information Site (http://www.scorecard.org/)**
- **U.S. EPA's Enviromapper (http://www.epa.gov/epahome/commsearch.htm)**
- **U.S. EPA's Toxic Chemical Release Inventory (TRI) Explorer (http://www.epa.gov/triexplorer/)**
- **U.S. EPA's Window to My Environment Site (http://www.epa.gov/enviro/wme/index.html)**
- **U.S. EPA's Enforcement and Compliance History (ECHO) Site (http://www.epa.gov/echo/)**

Tutorials & Info Sites

- **USGS GIS Tutorial (http://erg.usgs.gov/isb/pubs/gis_poster/)**
- **GPS Tutorial (http://www.colorado.edu/geography/gcraft/notes/gps/gps_f.html)**
- **NRCS National Cartography and Geospatial Center (http://www.ncgc.nrcs.usda.gov/)**
- **USGS National Mapping Information Site (http://mapping.usgs.gov/)**

Software Website Links

- **GeoDa – Free Spatial Analysis Software (http://www.csiss.org/clearinghouse/GeoDa/)**
- **Environmental Systems Research Institute (ESRI) – ArcGIS software (http://www.esri.com)**
- **MapInfo GIS Software (http://www.mapinfo.com/)**
- **Maptitude GIS Software (http://www.caliper.com/maptovu.htm)**

GIS Data Sources

- **The Geography Network (www.geographynetwork.com)**
- **The U.S. Bureau of the Census "TIGER" Line File Server (http://www.census.gov/geo/www/tiger)**
- **Zip Code Area Boundary Files Server (http://www.census.gov/geo/www/cob/zt_metadata.html)**
- **Movement Technology Institute (www.movementech.org/)**

GEOSPATIAL TECHNOLOGY

High Growth INDUSTRY PROFILE

Industry Snapshot

Growth Pattern

- The geospatial technology industry is defined as "an information technology field of practice that acquires, manages, interprets, integrates, displays, analyzes, or otherwise uses data focusing on the geographic, temporal, and spatial context." It also includes development and life-cycle management of information technology tools to support the above. *(Geospatial Workforce Development Center, University of Southern Mississippi)*

- The progressively complex and accelerating pace of change in the geospatial technology industry offers dramatic possibilities for meeting the increasingly sophisticated geospatial information demands of government, private industry, scientists, and the public. *(U.S. Geological Survey)*

Summer Workshops for Faculty - 2007

- 17-22 June 2007, The Ohio State University, Columbus, Ohio
- 15-20 July 2007, University of California, Santa Barbara
- Applications may be submitted at www.csiss.org/SPACE starting 15 January 2007

SPACE Spatial Perspectives on Analysis for Curriculum Enhancement

Scholarship Support

There are no fees required to participate in a SPACE workshop. Participants may apply for awards of up to a maximum of $1000. Participants from designated minority institutions in the United States, and participants of Hispanic American, African American, or Native American background may be eligible for additional scholarship support.

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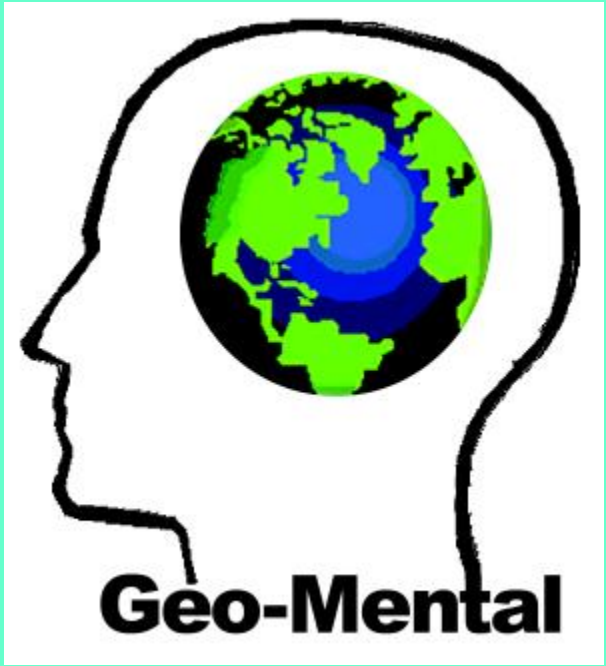

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