

# Diffusion of GIS in Public Policy Doctoral Program

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- This presentation demonstrate how GIS was introduced in the Public Policy Doctoral Program at Southern University, Baton Rouge.
- Rather than establishing a GIS concentration in the doctoral program, this research demonstrates how GIS is linked to the doctoral program's core advanced research methods course.
- How this policy change was engineered with a minimum of political resistance is a model other graduate programs can replicate.

# Nelson Mandela School of Public Policy

- The Nelson Mandela School of Public Policy and Urban Affairs provides programs that enable undergraduate and graduate students to understand major social, political and economic developments in society.
- These programs familiarize students with the values associated with positive and effective leadership in a democratic society, and will provide a framework for lifelong personal and professional growth.
- Students of the school gain the knowledge and skills they need in order to pursue and excel in graduate education or professional careers.

# The Doctoral Program

- The School's newest program, the Doctor of Philosophy in Public Policy, not only supports the university's historical mission to prepare and train outstanding African-American scholars, professionals and citizens, but explicitly broadens that mission by actively seeking outstanding graduate students of other races.
- Keeping with the mission of the university, the program has 3 pivotal goals namely 1) Education 2) Research and 3) Outreach. Geographic Information Systems plays a major role in all the three pivotal roles.
- The program has 4 full time faculty, 2 adjunct faculty and 3 staff.

# Technology Approach to Teaching

- The teaching projects have focused on innovative use of computers and modern equipment to enhance teaching and recruitment while the research projects have focused on using state of the art technology to develop technological-based public facilities management methods from innovative scientific techniques.
- This technology-based approach has a good potential of contributing to economic development. The role of Geographic Information Systems (GIS) and Remote Sensing (RS) in Public Policy was incorporated into the curriculum as a vital component.

# *GIS at SUBR Public Policy Program*

- The program has a fully fledged GIS/RS laboratories and initiatives which have resulted into one of the leading GIS initiative at Southern University.
- As an education tool GIS is critical as a training tool in all aspects of public policy. GIS fulfils the role of a vital computer skill required for maintaining public policy spatial inventories and databases.

# *GIS at SUBR Public Policy Program*

- Because of this, Southern University's Public policy graduates acquire the required computer skills to compete in the job market, as well as perform complex tasks required of a 21st century public policy professional. SUBR Public policy equips graduate who opt to do GIS with basic skills in desktop GIS, spatial analysis, image analysis and the basics of remote sensing.



- The research at the Department involves the following areas, Environmental Policy, International Studies, Finance, and Health Studies options. Even though GIS is defined as a research area, in reality GIS is also a useful tool in all other research areas.
- GIS is useful for preparing spatial inventories. In the outreach initiative, GIS has been utilized in projects in the City of Baton Rouge, the state of Louisiana, and internationally.



# Development of GIS at HBCUs

- GIS development at SUBR Public policy program can be put in context by considering the development of GIS at other HBCUs. Padgett (2000), reports that by the year 2000, a number of historically Black institutions employ GIS tools and technologies in their academic departments.
- In addition to Tennessee State, Clark Atlanta University, Alabama A&M University and Southern University-Baton Rouge are among a small group of historically Black institutions that make extensive use of GIS tools and techniques. Of the HBCUs offering public facilities sciences curricula, Alabama A&M, Florida A&M, and SUBR all have fully fledged GIS programs.

# The Situation in HBCU 10 yrs ago

- The development of GIS in HBCU Education curricula is emphasized by the 2002 White House Initiative on HBCU<sup>1</sup>s/US Department of Education.
- In a study carried out by Padgett (2000) preliminary findings of the 85 schools surveyed by Tennessee State University include the following: a) 6 percent offer degrees in geography, b) 60 percent offer geography courses , c) 12 percent offer courses with the words “GIS” in the course title, d) 20 percent offer courses that use GIS in their content , e) 20 percent are actively using GIS in research , f)19 percent have some presence of GPS and/or Remote Sensing technology .

# *GIS, RS and Public policy*

- GIS (Geographic Information Systems) are increasingly used by policy analysts and bureaucratic decision makers, but they are seldom used or discussed in political science. This presentation illustrates the power of GIS to analyze policy questions through a case study of forest management from an environmental politics class.

# GIS in Environmental Policy

- GIS can be used for a wide variety of tasks. It can be used for simple tasks such as public facilities mapping, which is useful for address matching as well as making evacuation plans.
- GIS can be used for natural resources management. With a GIS, one can see in detail the different types of natural resource areas, including wildlife habitation, forests, rivers, streams, and wetlands.

# GIS in Facilities & Land Management

- For facilities management, one can show exactly where such items as underground cables and sewer pipes are, in relation to their geographic location, as well as where they are located in relation to other items, such as public facilities addresses.
- Land management is also made easier by GIS, which can give exact detail to the location of zoning areas, give ownership details, as well as help with such tasks as water quality management and environmental impact studies.

# *Public Facilities Management Traditional Spatial Analysis vs GIS*

- GIS is a very important tool for the policy maker. It can show as little or as much detail as needed in a form most people can understand. With its ability to be easily understood, GIS enables policy makers to take the information to the public.
- This allows the public the opportunity not only to understand what is going on, but enables the public to be able to offer informed feedback, which is as important to the policy politician as it is to the policy analyst.

# Public Facilities Management

- State-of-the-art public facilities management software packages like GIS allow for entry of public facilities information, tracking of work requests and work histories, and facilitating the creation of custom reports for urban public facilities resource management purposes.
- For example the utilization of GIS allows municipal arborists to take inventories one step further they can map facilities and work with their information

# Municipal Managers

Hence, GIS programs allow municipal managers to:

- a) Map facilities while allowing quick visual surveys.
- b) make it easier to locate a public facilities in the field when a map is provided to indicate its location.
- c) utilize maps as powerful tools to illustrate needs and situations, and
- d) utilize a GIS capability to excel at powerful queries with visual results.



# Policy Issues

- In policy areas that voters consistently say concern them most, such as education, public safety, and the environment, GIS is making a difference that forward-thinking policy makers cannot ignore.
- GIS can not only implement legislators' and voters' decisions with remarkable effectiveness-- its ability to analyze and to demonstrate graphically the policy decisions themselves makes it an indispensable tool of good governing.

# *GIS and Public Health*

- Researchers, public health professionals, policy makers, and others use GIS to better understand geographic relationships that affect health outcomes, public health risks, disease transmission, access to health care, and other public health concerns.
- GIS is being used with greater frequency to address neighborhood, local, State, national, and international public health issues.

# *Global Positioning Systems (GPS) and Public Facilities Inventories*

- A popular method of public facilities position entry is to locate the facilities using GPS -- Global Positioning Systems. GPS is a network of satellites. Their ground station receivers are used to triangulate positions on the earth. Facilities can be located to within a meter with proper data handling.
- Inexpensive GPS units can locate public facilities to within 10-20 feet. To obtain data accurate enough for practical public policy map use, higher-end GPS hardware and software is necessary. Many public policy consulting firms will provide a qualified urban public facilities to evaluate the public facilities and collect the GPS data with proper processing for accurate locations.

# *Issues Considered When Creating the Public Facilities GIS*

- The process of creating a GIS, is essentially the same, whatever institution is in question (Godfrey, 2003). This process required the examination of five criteria which centered on the users of the proposed system. These were: 1) Needs/Requirements of the end users 2) Hardware/Software Requirements 3) Requirements of the GIS 4) Database Design Requirements 5) System Maintenance/Updating Requirements.

# Needs Considered in Integration of GIS in Public Policy PhD program

- The needs and requirements of the end users were usually the first criteria to be examined when creating SUBR's public policy GIS. It was important to outline and understand exactly the type of information the faculty, staff and students would put into the system and utilize on a regular basis.
- The needs were identified through the use of a questionnaire, and personal interviews that helped identify the needs. Many times the specific conditions of urban public facilities in Baton Rouge and Louisiana as whole, played a role in defining the characteristics of the required GIS.

# *GIS/RS Software*

- SUBR's Public policy GIS program uses the popular ESRI's suite of GIS products. Software used presently includes 20 ARCVIEW 3.2 licenses and ARCGIS software.
- The university has site licenses from ESRI. For Remote Sensing, SUBR Public policy program has 15 ERDAS Imagine licenses from ERDAS Inc. The program will also soon host and Integraph Geo-media GIS laboratory, as well as host Micro-Station GIS.

# Implementation Today

- In the PhD program, GIS and Spatial Analysis has been offered as an advanced research methods elective course option *PPOL 720. Advanced Research Methods* . GIS is used to equip the students with necessary analytical skills.
- Advanced training in analytical policy research methods will contribute to the strength and significant of the students doctoral research, and should enhance opportunities for the student upon graduation.

# The Course

- The course covers advanced design issues, methods for exploring data, and advanced geo-statistical techniques.
- Public policy researchers are able to understand, appreciate, and use diverse research methods in order to conduct ethical and accountable research.
- The employment of a variety of qualitative and quantitative methods, along with the use of computers is now critical to the conduct of scientifically sound research.



# Conclusions

- All public policy doctoral students must complete it. Moreover, all public policy doctoral students are equally required to incorporate GIS in their dissertation research.
- Therefore, the course integrates the foundations of advanced research methodology with use of computers and appropriate statistical procedures in order to prepare students to meet the increasing demands for conducting policy-relevant research.