

SU/Agricultural Research and Extension Center

Annual Accomplishments Report

2004 – 2005 ACADEMIC YEAR

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Urban Forestry Research Team

AGRICULTURAL AND EXTENSION RESEARCH CENTER

**PROJECT TITLE: A GIS-RS Supported NPS-Management Information System
for Urban Agriculture**

(USDA -CSREES RESEARCH PROJECT)

Objectives addressed in this performance period:

The objectives of this study are to

- a) To identify factors that influence nonpoint source pollution arising from urban agriculture in Louisiana.
- b) To investigate the spatial relation between agricultural landcover and nonpoint source pollution.
- c) To design a spatial decision-making model relating the impact of urban agriculture to water quality in urban agriculture in Louisiana, and
- d) Dissemination of the findings as nonpoint-source Education for Urban Agriculture

Progress Report on Research

Objective a) and b) of this project are complete. Some progress has been accomplished towards objective c). Research work has been done in the Baton Rouge area, and is on-going and the following accomplishments have been done:

1. Urban agriculture related sources of non-point source pollution in the East Baton Rouge Parish and nearby urban areas were identified.
2. The graduate student hired, and given the task of tackling objectives a & b, has accomplished this goal, and is now working on the spatial decision-making model relating to urban agriculture.
3. GIS databases identifying sources of non-point source pollution, particularly those related to urban agriculture have been identified and documented.
4. Collation of base maps of the area pertinent to the research were is complete. In the past year more base maps were digitized from hardcopy to GIS format.

Key Theme: Construction of a GIS Nonpoint Source Management System

The recognition of urban agriculture presents new challenges to agricultural experts. The combination of small farms, horticulture operations, urban-forestry and vegetable gardening in urban and suburban areas has generated accompanying environmental challenges. Urban Forestry is the planning, establishment, management and protection of trees and forests in urban and rural communities. Urban forestry necessitates the education and training of people who live and work in urban environments. In order to optimally use the land, it is not only necessary to have the information on the existing water resources, land use / land cover, but also to monitor the dynamic land use resulting from the increasing demands arising from the growing population. Impacts on water pollution have led to efforts to address the Total Maximum Daily Load (TMDL) issue in Louisiana. This project will utilize already existing databases from EPA's BASINS program that integrates GIS into water quality assessment

Institutional Long Range Goals.

This project ties in with the mission statement of the Southern University Agricultural and Extension Center (SUAREC), which is *"To conduct basic and applied research and disseminate information to the citizens of Louisiana in a manner that is useful in addressing their scientific, technological, social, economic and cultural needs."* In July, 2001, SUAREC officially opened. It now includes the Cooperative Extension Program as well as the agricultural and family and consumer sciences research program. SUAREC has six base program-areas. Of the six the two relevant to this project are the a) Sustainable Agricultural Systems program, and b) the Urban Forestry and Natural Resource Management programs. This project fits in the highest priority of SUAREC's strategic plan primary goals, the first one of which states that SUAREC *strives to strengthen the productivity, profitability and competitiveness of Louisiana's agriculture, forestry and fisheries while enhancing the environment and wise use of natural resources.*

SUAREC's mission, base program areas and primary goals, are all outlined succinctly in SUAREC's 2003-2008 strategic plan, which elaborates SUAREC's long-term five year goals. The strategic plan's objective for sustainable agricultural systems explains that sustainable animal and plant productivity are paramount to the agricultural sector in Louisiana. In the action strategy for this objective SUAREC strives to modernize facilities and conduct research activities geared to traditional and non-traditional agricultural stakeholders. The second goal is to promote good environmental stewardship. The second goal is to be achieved by seeking ways to utilize natural resources in an environmentally safe manner.

This project supports USDA's strategic goal 1, objectives 1.4 and 1.5 which call for providing scientifically based information, knowledge and education that promote efficiency in agricultural production systems. It also support strategic goal 5, objectives 5.1 and 5.2, that call for providing science based knowledge and education to improve the management of forests, rangelands, as well as soil, air and water resources, in manner such as to enhance the environment.

Output Indicators

Benefits of the research will be disseminated to impact the stakeholders in the following ways:

- Development of a NPS research website.
- Development of a display of computer based model from our research.
- Publication of informational brochures, booklets, and handbooks.
- Hands-on workshops at SUAREC and LSU Ag-Center.
- Publication of educational materials.
- Presentations/ Demonstration/discussions with stakeholders
- Demonstration of Internet Based GIS Data warehouse.
- One-on-one technical assistance.

Procedures:

1. Meeting with the Administrators of Extension to get introduced to Southern University and Louisiana State University agricultural center extension agents
2. Attendance of HBCU Water Quality Conference to network and liaise with other universities.
3. Meeting with agricultural extension agents to discuss the goals of the research and to gain access to stakeholders.
4. Meeting with local community environmental and urban forestry action groups at East Baton Rouge Parish urban watersheds conference, September 9th, 2005.
5. Conducted a multi-faceted needs assessment. This assessment will include:
 - a. Face to face meetings
 - b. Literature review of local and statewide materials
6. Liaison with Louisiana Department of Environmental Quality to synchronize and harmonize research with TMDL goals and priorities.
7. Work with the extension agents to effectively implement the project using stakeholder input.

Benefits of the research will be disseminated to impact the stakeholders in the several ways:

Impact Adverse impacts on water pollution have led to efforts to address the Total Maximum Daily Load (TMDL) issue in Louisiana. This project will utilize already existing databases and those from EPA's BASINS program that integrates GIS into water quality assessment to evaluate nonpoint source pollution due to urban agriculture in Louisiana. The Rural-Urban agro-ecosystem is a biological and natural resource system that is managed jointly by rural and urban people to provide services to the environment. This agro-ecosystem generates direct and indirect business and health benefits to society, and contribute recreation and leisure outlets for an urbanizing society. Rural-urban

agroecosystems approach can help evaluate the impact whole agriculture system in the context of urbanization and non-point source pollution..

The research conducted at the Southern University Research and Extension Center (SUAREC) will contribute enormously to ongoing mitigation of non-point source pollution and will providing new research-based information that was previously not available. The research topic is of significant importance to the state of Southern University and the State of Louisiana. The project adds to ongoing efforts conducted by Louisiana DEQ and is priority area in Louisiana.

Major Findings: The research conducted is the completion of collating and documenting knowledge sources of non-point source pollution in the East Baton Rouge Parish. Material pertinent to urban agriculture has been documented. The research topic is of significant importance to the state of Southern University and the State of Louisiana.

The CSREES grant was used to leverage for external funding from the state. A competitive research equipment grant titled **“I-TEST Mission to Planet Earth” in the amount of \$1.5 million** was written and submitted to the National Science Foundation .The funds from this project will be used to train Louisiana middle school teachers in GIS applications in agriculture. Hopefully, the long-term sustainability of the project will surpass the funding period because of the additional external funding received.

Publications

ESRI Educ2005 Conference Proceedings. Scientists and Educators using GIS

National Urban Forestry Conference Proceedings Urban Forestry professionals.

B. Books and Book Chapters – List the books, book chapters or related contributions to book chapters anticipated during this performance period **(FTE Commitment :)**

Book/Chapters/Contribution	Anticipated Completion Date
Bayou Bodcau Management Plan	October 30, 2004

Presentations

C. Presentations - List presentations (oral, poster, electronic) to professional and lay groups anticipate during this performance period. Time commitment must be identified for planning each presentation proposed. **(FTE Commitment:)**

Title of Article	Anticipated Completion Date	Source of Publication
Application of GIS at Lee High Urban	April 17th 2005	Louisiana GIS/Remote

Ecosystem System Study		Sensing Conference
Application of Trimble GPS in Tree Inventory Studies in Old South Baton Rouge	July 30th, 2005	ESRI Educ2005 Conference Proceedings
Application of GIS to Evaluate Nonpoint source pollution Impact of Urban Agriculture	July 30th, 2005	ESRI Educ2005 Conference Proceedings

Planned extension publications for this planning period are as follows:

Nonpoint source Impact of Urban Agriculture	April 19, 2006
Trees and Hydrology Series	May 15, 2006
Youth Participation in Non-point Source Mitigation	April 15, 2006
What you need to look for in the Clean Water Act.	July 15, 2006

Magazines or newsletter articles

Article on GIS/GPS Applications in Urban Forestry – Published in Southern Digest May 2005.

Professional Activities

List the services anticipated on committees in professional organizations during this performance period.

Level	Organization	Committee
National		
Regional	Louisiana Groundwater Commission	
Local	Louisiana Groundwater Task Force	

Participate in professional organizations as a session organizer, presider or discussant during this performance period.

Level	Organization	Involvement
Regional	Louisiana Groundwater Commission	Commissioner
	Louisiana Groundwater Task Force	Member

Professional organization meetings in area of specialization anticipated attending in area of specialization during this performance period.

Level	Organization	Meeting
National	ESRI Educ2005	Annual Meeting
Regional	Louisiana GIS/RS	Annual Meeting
Local	LSU Ag Center	Annual Meeting

Office held in leading professional organizations during this performance period.

Level	Organization	Office
Nat Level	HBCU Agroforestry Task Force	Secretary
Regional	Louisiana Groundwater Commission Louisiana Groundwater Task Force	Commissioner Member

Innovative Work: Development of Trimble GPS Application Manual

This project is a multi-state project and the results have been shared with the following institutions:

- Southern University Agricultural Research and Extension Center
- Louisiana State University
- University of Nebraska
- Alabama A&M University

Overall achievements of Fulbert Namwamba during this period of time

NSF Grant worth	1,500,000	PI
Peer Review Papers submitted		2
Abstracts		6
Presentations		6
Training Workshops		2
International Liaisons		1
Seminars attended		5
Graduate students graduated		2
Thesis Committees		4
Public Service (Commissions & Committees)		3
National Task Forces		1
Outreach to Organizations & NGO		2

Funding Source(s):

1. Evans-Allen (USDA/CSREES)