

# Identification and Discussion of Collaborative Research Topics : “Oil Spill and the wildland-Urban Interface”

Kamran K. Abdollahi, Ph.D.

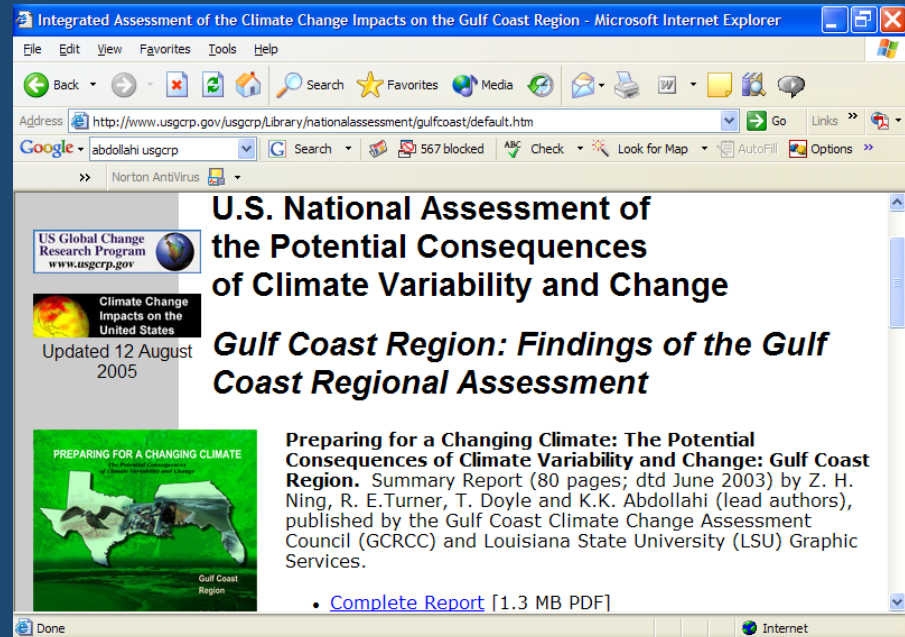
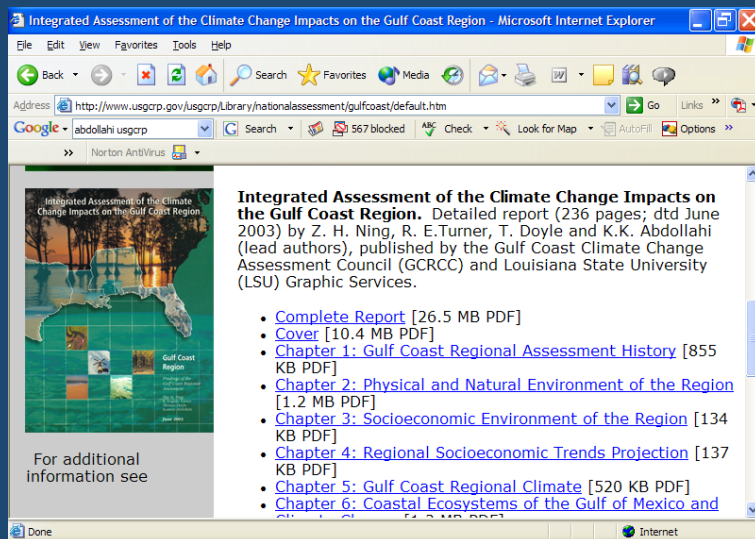
Urban Forest Ecosystem Management and Ecophysiology

Urban Forestry Program

SUBR Division of Agricultural Sciences &

SU Agricultural Research and Extension Center

# National Climate Change Assessment : Gulf Coast Climate Change Assessment





# UNIVERSITY RESEARCH CENTER FOR COASTAL ZONE ASSESSMENT & REMOTE SENSING

In Collaboration with  
NASA

NASA-Stennis Space Center

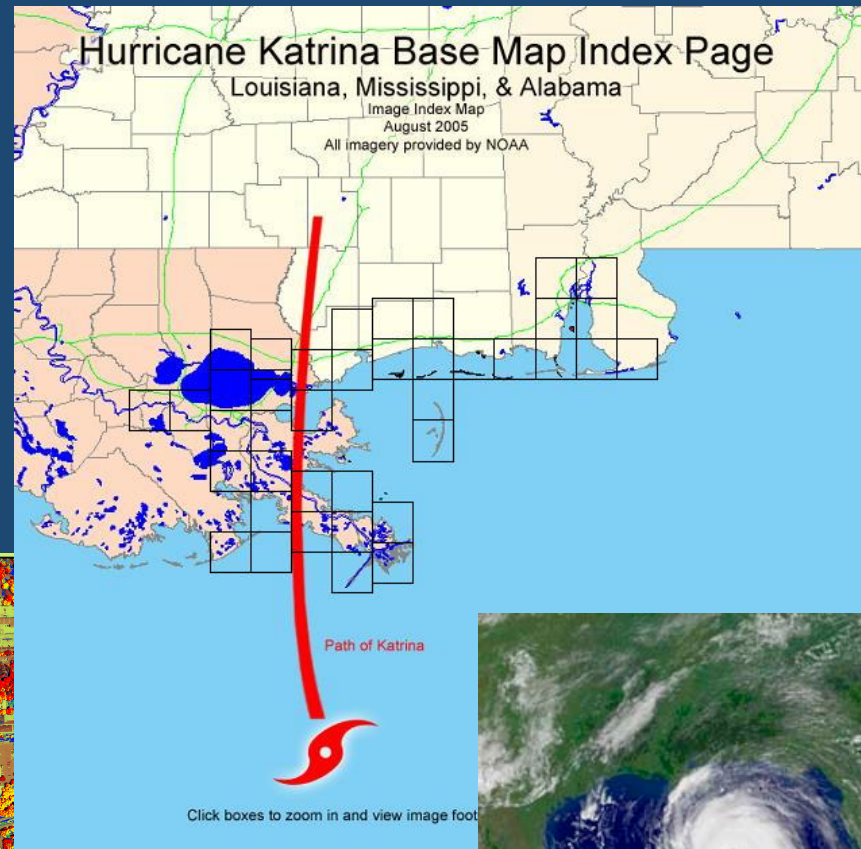
# Ongoing Research Collaboration

- USDA-CSREES(NIFA)
- USDA-FS
- FS Urban Forestry Centers
- NRCS
- NASA
- EPA
- USGS, NWRC
- DOE
- Gc-CESU
- LSU
- Texas A&M
- Penn State
- Purdue
- University of Florida
- Auburn
- 1890 institutions
- Virginia Tech

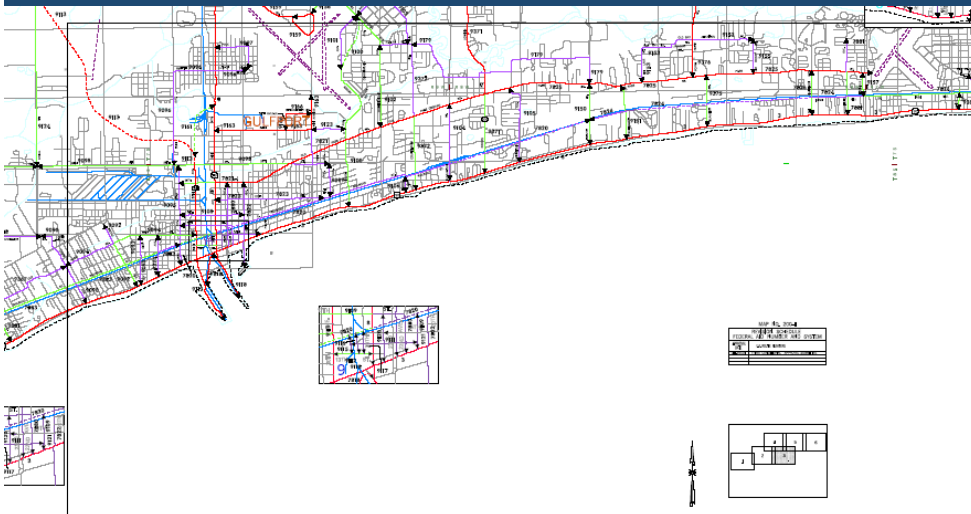


# QUANTIFYING URBAN FOREST ECOSYSTEM SERVICES FOR THE GULF COASTAL COMMUNITIES

- Benefit & Hazard Assessment
- Urban Forest Ecosystem Analysis
- GIS Mapping & Tree Inventory

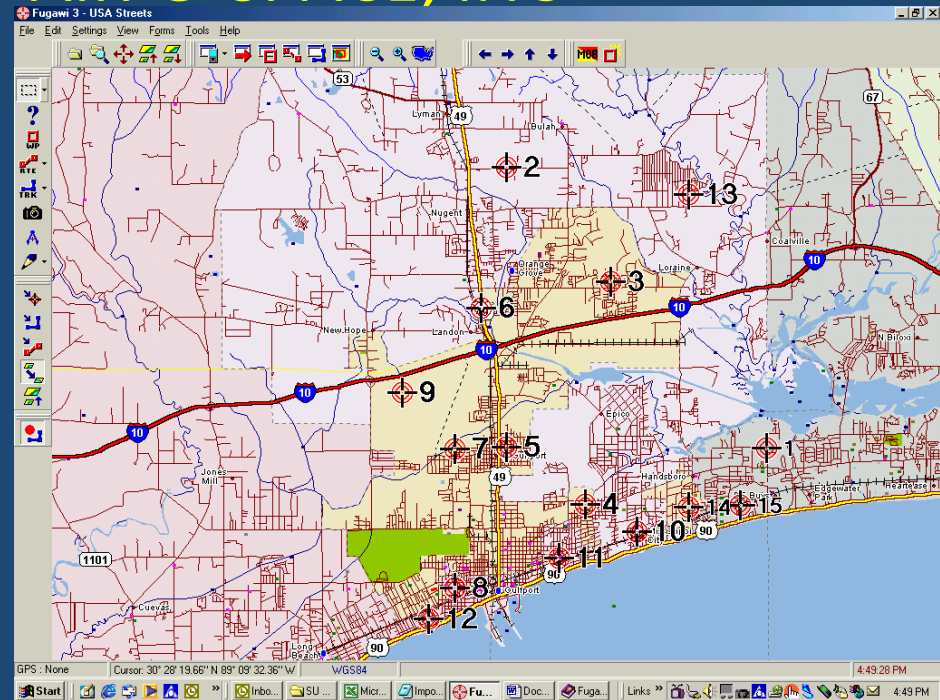


# Urban Ecosystem Analysis for the Gulf Coastal Communities



# TECHNICAL SPECIFICATIONS FOR FLIGHT BY AIR-O-SPACE, INC

- The following film, camera, processing and mission parameters were used.
- Film Specifications:
  - Kodak 220 Natural Color 160 ASA
  - Negatives scanned at 1600 dpi, Resulting in a pixel resolution of approximately 1.2 ft
- 70mm Camera Specification:
  - HasselBlad 70mm camera
  - 50mm focal length lens
- Tile Size (coverage area) = 40 ft by 4015 ft
- **RANDOM SELECTION OF TILES**

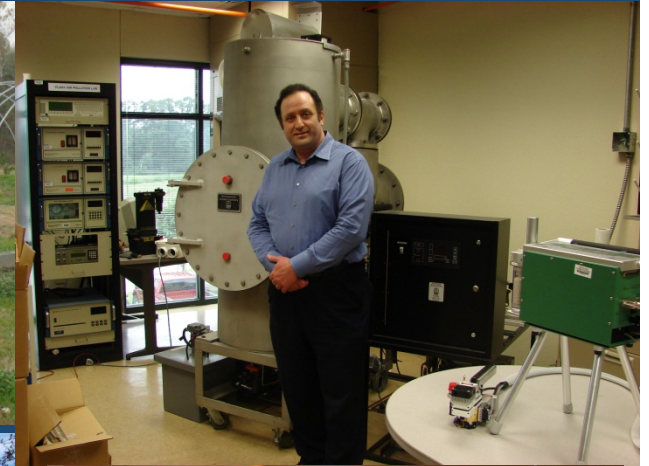


Tile Number	Roll	Picture	Date	Latitude (N)		Longitude (W)	
				Deg	Min	Deg	Min
1	20	23.4	4/2/2001	30	24.349	89	0.100
2	11	13.18	4/2/2001	30	28.946	89	5.429
3	15	17.11	4/2/2001	30	27.074	89	3.292
4	14	16.2	4/2/2001	30	23.428	89	3.806
5	11	13.8	4/2/2001	30	24.367	89	5.424
6	9	12.13	4/2/2001	30	26.643	89	5.950
7	8	11.8	4/2/2001	30	24.336	89	6.490
8	8	10.3	4/2/2001	30	22.065	89	6.488
9	22	9.10	4/2/2001	30	25.268	89	7.565
10	23	18.2	4/2/2001	30	22.983	89	2.751
11	13	15.2	4/2/2001	30	22.551	89	4.356
12	8	10.2	4/2/2001	30	21.564	89	7.031
13	4	7.9	4/2/2001	30	28.513	89	1.688
14	5	8.14	4/2/2001	30	23.396	89	1.689
15	19	22.2	4/2/2001	30	23.412	89	0.634



## URBAN FORESTRY RESEARCH

- Urban Forest Eco-physiology
  - Flooding Stress
  - Drought
  - Soil Compaction
- Urban Forest Air and Water Quality
- Urban Forest soil and Phyto-remediation
- Climate Change and Urban Forest
- Urban Forest Ecosystem Analysis
- Arboricultural Research

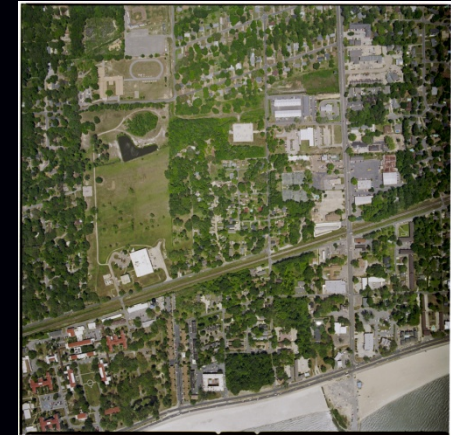




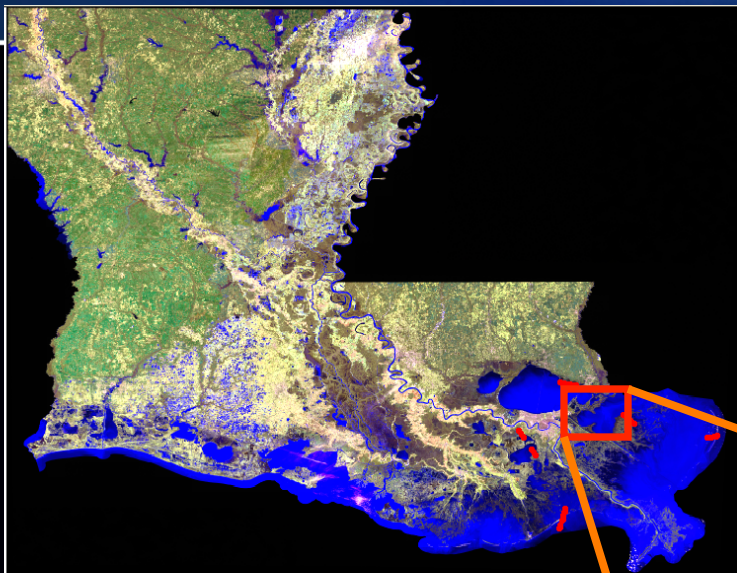
# Remote Sensing Signal and Image Processing

## USING MULTISPECTRAL IMAGES, PRINCIPAL COMPONENT ANALYSIS AND DISCRIMINANT ANALYSIS

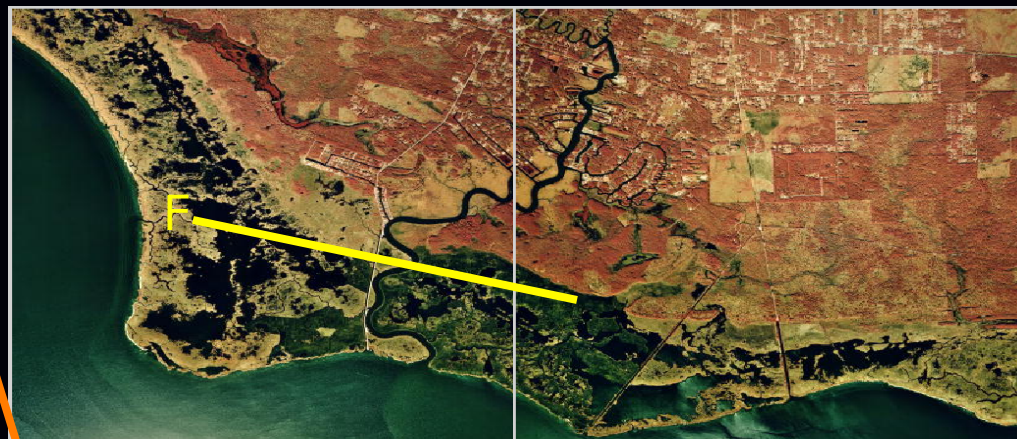
The GIS processes and PCA were used to determine the proportion of mapped landscape elements surrounding 14 randomly selected locations (tiles= 17x17 acre) where tree inventory data had been collected.





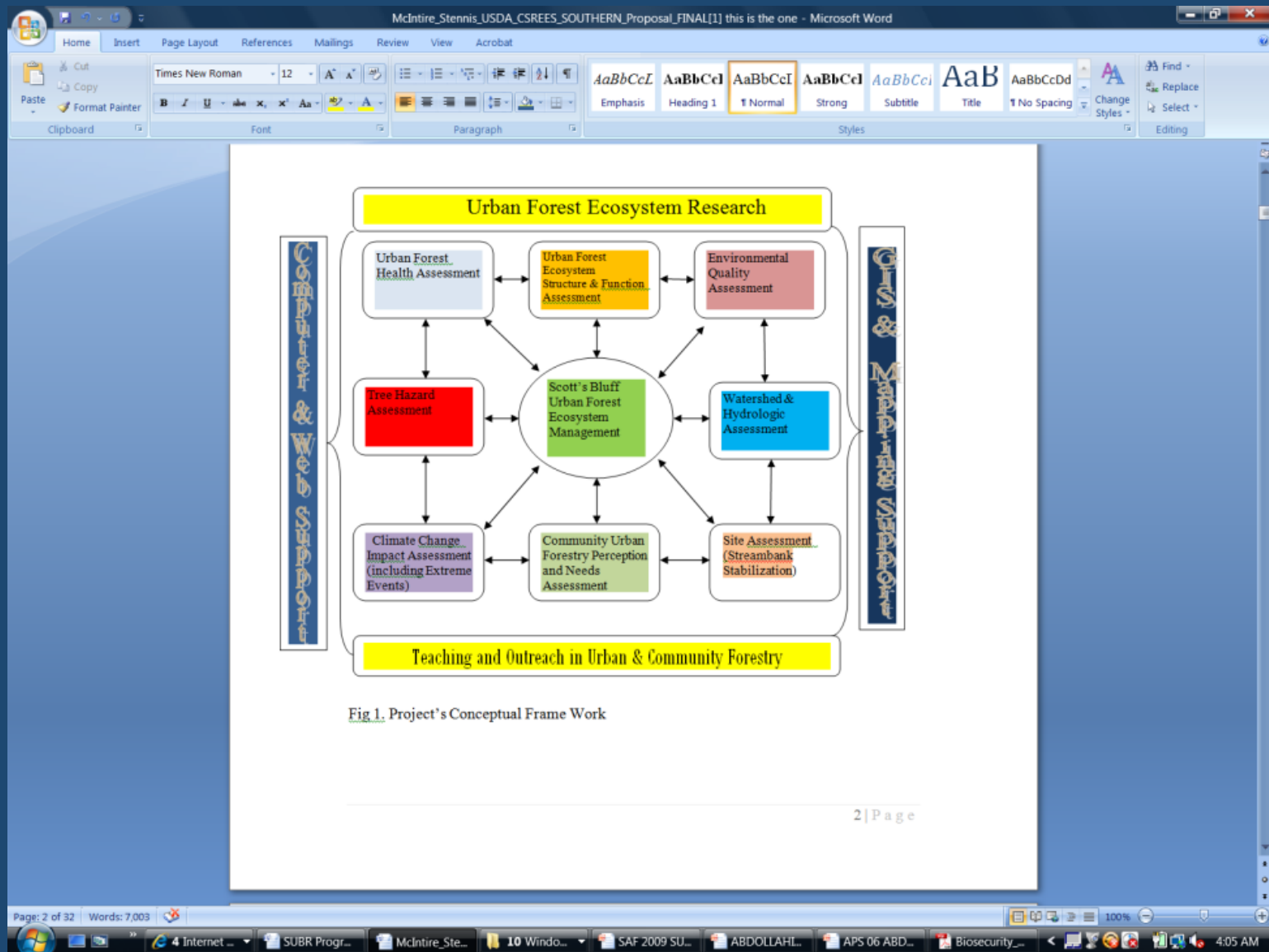


## Field Study Site: Bayou Lacombe



# Ongoing Research Activities

- Carbon sequestration
- Pollution
- Application of Nanotechnology
- Biobased Mulch
- Plant Biosecurity
- Inventory & Mapping
- 
- Urban Forest Restoration
- Tree Decay Detection
- Quantification of Structure & Function of Urban Forests
- Hurricane Damage Assessment
- GIS & Remote Sensing Application













CO<sub>2</sub> Flux Measurements Using  
LICOR LI-8100 Automated CO<sub>2</sub> Flux  
System

Soil Temperature Sensors

Soil Moisture Sensors

TDR for Soil Moisture Potential



# RESEARCH

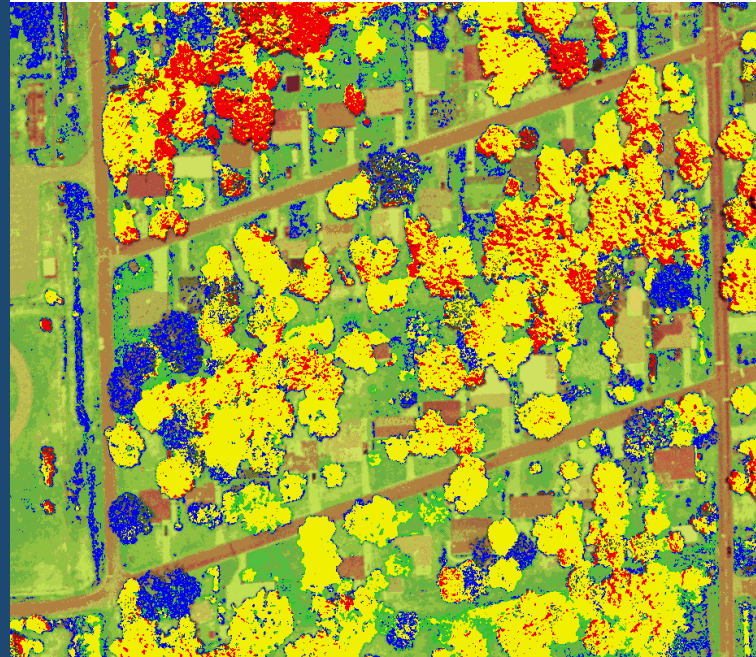
- TREE INVENTORY DATA BASE
- GIS-BASED MAPS
- UFORE ANALYSIS
- LAND USE ANALYSIS
- WEBSITE:
  - [WWW.URBANFORESTRY.SUBR.EDU/CCZARS](http://WWW.URBANFORESTRY.SUBR.EDU/CCZARS)

## Urban forest ecosystem structure and the function of the gulf coastal communities in the United States

K. K. Abdollahi<sup>1</sup>, Z. H. Ning<sup>1</sup> & M. Stubblefield<sup>2</sup>

<sup>1</sup>Urban Forestry Program & NASA Center for Coastal Zone Assessment and Remote Sensing, SU, U.S.A.

<sup>2</sup>Center for Energy and Environmental Studies, SU, U.S.A.



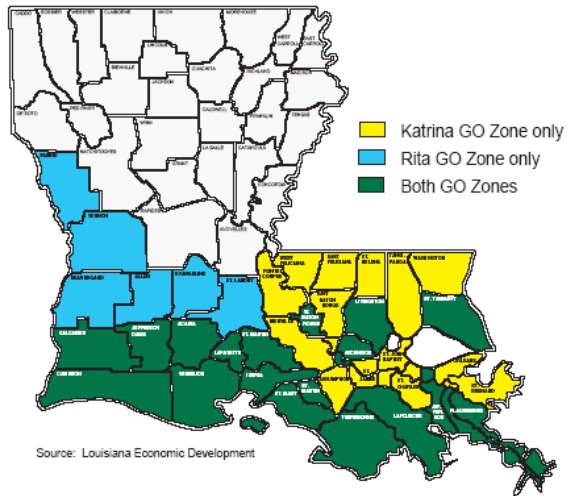
WIT Transactions on Ecology and the Environment, Vol 81, © 2005 WIT Press  
[www.witpress.com](http://www.witpress.com), ISSN 1743-3541 (on-line)



# URBAN FOREST RESTORATION AND OUTREACH ACTIVITIES IN LOUISIANA

- Tree Planting
- Community Education & Outreach
- Workshops, Seminars and Forums
- Site Planning, Species Selection
- Arboricultural Activities & Training
- Collaboration with the LA DA&F, USDA-FS, LSU, and NGO's

## Gulf Opportunity Zone Eligibility



Katrina Gulf Opportunity Zone - 31 parishes eligible  
 Rita Gulf Opportunity Zone - 23 parishes eligible  
 (note: some of these are also eligible for Katrina zone provisions)  
 Total of 37 parishes eligible for some provisions of the Gulf Opportunity Zone Act



# A New Way of Thinking

- “We require no less than a whole new way of thinking about how we design and build our communities in hazard areas, If we are to ensure our societies safety, health, and overall quality of life.” (Donald E. Geis, 2000 )

# Disaster

Disaster is defined as a serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources.



# Disaster Management

In order to reduce the undesirable impacts of disasters, there are world wide trends on managing disasters. Disaster management is a cycle of activities beginning with

- mitigating** the vulnerability and negative impacts of disasters;

- preparedness** for responding operations;

- responding and providing relief** in emergency situations ; and **aiding in recovery** which can includes physical reconstruction and the ability to return quality of life to a community after a disaster.

# Why More Research?

- Our present approach is inadequate and is inflicting great and growing harm: Physically, environmentally, socially, economically, and emotionally that we can no longer tolerate.

# Potential Research

## Focus

- Impact on Coastal Ecosystems and Urban/Rural Communities
  - Urban wetland Ecosystems
  - Urban-Wildland Interface

Remediation of Contaminated Soil, water, and Vegetation  
Air Quality Mitigation

Hurricane impact on oil spill

## SU Capabilities

- Ecological Studies
- Socio-economic Studies
- Human Health impact studies
  - Monitoring
  - Mapping
  - Modeling

# Research, Education and Outreach

- Ecophysiological impact assessment
- Quantifying Impact on ecosystem services
- Developing predictive models
- Long-term ecological monitoring
- Social studies
- Community impact assessment
- Integration into education
- Workshops and community outreach

# OUTREACH/EXTENSION WORKSHOPS


**Workshop on How to Detect Internal Decay of Trees**

April 2-3, 2007  
Conference Room 191, A. O. Williams Hall,  
Southern University Agricultural Research and Extension Center,  
Baton Rouge LA

**PICUS<sup>®</sup>**  
Sonic Tomography

**Workshop Activities**

**Day 1: April 2, 2007**  
9:30-10am Registration  
10am-12noon Theoretical (indoor) session I  
This lecture will give an introduction to the theory of the state-of-the-art PICUS Sonic Tomograph equipment for detecting internal decay of trees and shows examples of instrument operations.




Lunch on your own in SU Mayberry Dining Hall

1:30pm-4pm Training (Outdoor) Session  
Demonstration first and "do-it-yourself" afterwards on easy trees

**Day 2: April 3, 2007**  
10am-12noon Theoretical (indoor) session II  
The second theoretical session will give more detailed information to better understand how the instrument works, including a question-answer session.

Lunch on your own in Mayberry Dining Hall

1:30pm-4pm Field operations and hands-on training on difficult trees using the PICUS instrument. Selected trees: water oak, live oak, etc.



**Organizers:** Yulong Qi and Daniel Collins, Professors of Urban Forestry at SU, Baton Rouge LA; and  
Lodnar Gönke, Argus Electronic GmbH, Rostock, Germany

**Sponsors:**  
SU Urban Forestry Program, USDA-CBOP Grant 2006-38820-17498  
SU Agricultural Research and Extension Center, Urban Forestry Extension RREA Grant

**PLANT BIOSECURITY SYMPOSIUM**  
Southern University and A&M College

"Frontline Biosecurity Symposium" featuring presentations from scientists and professionals working on the front lines of research and monitoring of high consequence plant pathogens, insect pests, and invasive species that are a threat to our nation's agriculture and natural resources.



**List of Participating Universities and Agencies**

- Penn State University - Plant Pathology Dept.
- LSU - Plant Pathology and Crop Physiology Dept.
- Southern Plant Diagnostic Network/ Univ. of Florida
- Southern University Urban Forestry Program
- USDA ARS Foreign Disease - Weed Science Lab
- USDA APHIS Plant Protection and Quarantine
- US Customs and Border Protection, Department of Homeland Security
- Federal Bureau of Investigation (FBI)
- US Forest Service Civil Rights Unit
- Louisiana Dept. of Agriculture and Forestry - Horticulture & Quarantine Programs

**Date:** November 6 - 7, 2007  
**Location:** Southern University  
Agricultural Research and Extension Center  
6.A. Little Drive, Baton Rouge, LA 70813

November 6, 2007 - Presentations 8:00a.m. - 4:00p.m.  
November 7, 2007 - Hands-on Demonstrations 8:00a.m. - 12:00p.m.  
(Lunch provided on November 6th)

For Information Contact: Dr. Daniel Collins, Urban Forestry Program SU358



# Our Research Focus

- Urban Forest Management
- Urban Forest Soils
- Arboriculture
- Environmental Pollution
- Ecophysiology
- Plant Biosecurity
- Nano-Technology Application
- Bioenergy
- Climate Change