

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Climate Change

Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
123	Management and Sustainability of Forest Resources		10%		10%
124	Urban Forestry		50%		45%
132	Weather and Climate		10%		10%
133	Pollution Prevention and Mitigation		10%		10%
134	Outdoor Recreation		5%		5%
205	Plant Management Systems		10%		5%
403	Waste Disposal, Recycling, and Reuse		5%		15%
	Total		100%		100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	3.0	0.0	5.0
Actual Paid	0.0	1.1	0.0	4.4
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	55000	0	243992
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	74040	0	204305
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	3980

V(D). Planned Program (Activity)

1. Brief description of the Activity

During the plan period, we will conduct the following activities/interventions:

1. Research and quantify the environmental benefits of urban forests, carbon sequestration and the urban forest effects on air quality.
2. Research and quantify urban forest effects on UV exposure in relation to proper vegetation design.
3. Communicate research results and other information with citizens through extension personnel in the form of publications, conferences, workshops, field days, home/office visits, demonstrations and other educational resources.
4. Prepare publications such as research reports and highlights based on gulf coast climate/weather studies, plant biosecurity and disseminate information to citizens through extension personnel in the form conferences, workshops, field days, home/office visits, demonstrations and other educational venues.
5. Areas affected by past hurricanes and other natural disasters will receive specific attention to enable them rebuild their tree population.
6. Collaborate, cooperate and partner with local, state and federal agencies, institutions, groups, private organizations/associations in seeking and delivering services to citizens.
7. Assist citizens in developing disaster/emergency plan including mechanisms for assistance to victims

2. Brief description of the target audience

Target audience includes all citizens such as homeowners, metro areas, garden clubs, arborists, small producers, limited resource producers, socially and economically disadvantaged, women, minorities, and communities. Others are youth (13 - 18 years and even those in grades K-8), community leaders/stakeholders, interested agencies and organizations.

3. How was eXtension used?

Clients who had urgent questions in areas that the SU Ag Center did not have experts onboard were often referred to eXtension for answers to such questions.

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	2670	54381	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2014
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total
Actual	0	5	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- 1. Number of educational program activities

Year	Actual
2014	83

Output #2

Output Measure

- 2. Number of educational contacts

Year	Actual
2014	57051

Output #3

Output Measure

- 3. Number of published materials distributed

Year	Actual
2014	5061

Output #4

Output Measure

- 4. Number of research & extension outreach publications developed (in-house)

Year	Actual
2014	5

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	1. Percent of clients who gained new knowledge/skills, and awareness
2	2. Percentage of adoption rate for recommendations by clients.
3	National Outcome #1: Development of new knowledge and technologies

Outcome #1

1. Outcome Measures

1. Percent of clients who gained new knowledge/skills, and awareness

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	2670

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Ozone depletion in the upper atmosphere has resulted in a significant increase in solar ultraviolet-B radiation (UV-B, 280-315nm) on the earth surface. Effects of the enhanced UV-B on living organisms and ecosystems have been a major concern for more than two decades. Nearly two-thirds of 400 plant species/cultivars, mainly annual crops, appear to be UV-B sensitive. Relatively little information exists on the effects of UV-B radiation on forest tree species, which account for 80% of the global net primary production. With the future uncertainty of ozone recovery and climate change, there is a critical need for systematic evaluation of UV-B impacts on forest/tree species. UV-B impacts are many and some have serious economic consequences. Many United States residents do not have sufficient knowledge about these impacts especially as they relate to health.

What has been done

Externally funded grant with Evans-Allen research funds were used to study Ultraviolet-B Radiation protection strategies especially in selected southern trees. The study is helping to identify and quantify UV-B absorbing compounds (flavonoids/phenolics) using UV-VIS Spectroscopy and HPLC, and to measure leaf epidermal screening effectiveness to enhanced UVB using a fiber-optic microprobe system. Information gathered through this research is being prepared and shared to citizens and the scientific community. The aim is to provide reader-friendly fact sheets that citizens can use to increase knowledge on ways of selecting trees that can help to protect the environment from the adverse effects of UV-B. Information sessions, workshops, and seminars about climate change were also provided.

A mobile UV monitoring and research station was established at Southern University, this facility was used to train faculty, staff and students through collaboration with USDA UV-B Monitoring

and Research Program (UVMRP) at Colorado State University.

Project staff attended and made presentations at the International Union of Forest Research Organizations (IUFRO) XXIV World Congress and the International Union of Photobiology (IUPB) 16th International Congress on Photobiology. Two WebPages were created one through Southern University Ag Center (<http://www.suagcenter.com/tree-ecology>) and the other through Research Gate (https://www.researchgate.net/profile/Yadong_Qi2/publications) to disseminate information pertaining to research findings.

Results

One journal article was published (<http://www.international-innovation-northamerica.com>) and two international presentations were made "UV Radiation and Its Impact on Skin Cancer in the United States" and "UV-B Tolerance Properties Exhibited in Diverse Broadleaf Trees" at the 16th International Congress of Photobiology 2014 IUPB Conference. The results of the UV-B research were shared with the scientific and extension communities and also with the target audience - homeowners, garden clubs, arborists, small producers, limited resource producers, socially and economically disadvantaged, women, minorities, and communities. They gained new knowledge about climate change, the impacts of UV-B on the environment, and the possible adaptation strategies. Implementation of these projects has resulted in strengthened relationship and collaboration with other states and institutions. Based on the current findings, citizens have become more aware of the dangers of UV-B and how to select trees to plant that can help to minimize potential harmful effects.

One M.S. thesis was generated relative to the expanded effort on tree canopy UV transfer model. The project provided experiential learning and research opportunities for two undergraduate student interns from Rice University and two graduate student thesis from Southern University. It also supported a PhD student from Beijing Forestry University, a postdoc research scientist and two international visiting scholars (in collaboration with Chinese Academy of Forestry).

Many urban forestry students have benefited from the project and gained general knowledge on how plants interact with UV radiation. Also, 18 students in the urban forestry program gained knowledge about climate change and UV-B research.

Two WebPages were created (<http://www.suagcenter.com/tree-ecology>) and (https://www.researchgate.net/profile/Yadong_Qi2/publications) to disseminate information pertaining to research findings.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
124	Urban Forestry
132	Weather and Climate
133	Pollution Prevention and Mitigation
134	Outdoor Recreation
403	Waste Disposal, Recycling, and Reuse

Outcome #2

1. Outcome Measures

2. Percentage of adoption rate for recommendations by clients.

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	85

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Knowledge of urban wood waste utilization and mulch management is lacking due to insufficient research and low availability of research-based educational information. Knowledge urban wood waste utilization and mulch management could allow for more efficient and economic use of urban plant-based residue (including wood waste) by way of organic mulches. Research can assist in assessing the impact of the following Louisiana natural resources: cypress mulch, longleaf pine needles, loblolly pine bark, municipal oak tree residue, and mixed non-oak hardwood mulch products, on soil carbon cycling, sequestration, and chemical composition. Also, the effects of selected tree-based mulch treatments on the dynamics of growth and development (physiology, morphology, and anatomy) of live oak tree species and its associated rhizosphere dynamics can be studied. Research-based educational information can be made available to producers, land owners and home owners on the effects of selected tree-based mulch on root disease severity of live oak tree rhizosphere, microbial population dynamics, and saprophytic survival of selected soil borne plant pathogens.

What has been done

A collaborative project between Southern University Agricultural research and Extension Center, USDA-NIFA, and the USDA-FS was conducted to make contributions toward addressing the challenges of the emerging biobased industry with outcomes that support research, development, demonstration, and pre-commercialization activities. Additionally, through collaborative efforts with the Gulf Coast Cooperative Ecosystem Studies Unit (GC-CESU) and non-profit organizations the restoration efforts in Louisiana, Mississippi and other neighboring states are being impacted. Collaboration with the private sector and arboricultural companies has promoted the utilization of wood waste, especially, the urban wood waste in Louisiana. Utilization of urban wood waste and

biobased plant residue has several potentials and major impacts such as: expanding and extending the life of the wood fiber supply; contributing to carbon storage, thereby reducing greenhouse gases; reducing the amount of recoverable wood going to landfills; and stimulating new technologies and market to utilize recoverable wood fibers. Students and faculty in urban forestry and traditional agricultural research and extension were involved. The results of this study have been disseminated to the scientific communities through the Society of American Foresters (SAF), International Society of Arboriculture (ISA), 1890 Association of Research Directors Conference, State, regional, and national meetings sponsored by the USDA and other federal partners. In addition, the results have been provided to the residents of Louisiana through extension agents.

Other network of partners & organizations were included for this project such as, ISA, SAF, Louisiana State University, Louisiana Department of Environmental Quality, the Louisiana Department of Agriculture & Forestry, the Gulf Coast Cooperative Ecosystem Studies Unit (GC-CESU), and the City of Baton Rouge, LA.

An invited paper was presented at the 2014 International Society of Arboriculture (ISA) Annual International Conference and Trade Show before over 350 participants.

Results

Eight scientific presentations, three national and two international articles were published. One PhD dissertation is being developed and three M.S. students are developing thesis and capstone projects. An invited paper was presented at the 2014 International Society of Arboriculture (ISA) Annual International Conference and Trade Show August 2-6 before over 350 participants.

This project has increased the capacity of Southern University Ag Center in biomass utilization research. Significant network of partners & organizations collaborated on this project: ISA, SAF, Louisiana State University, Louisiana Department of Environmental Quality, Louisiana Department of Agriculture & Forestry, the Gulf Coast Cooperative Ecosystem Studies Unit, and the City of Baton Rouge, LA.

The arboricultural industries: ISA and SAF are utilizing the outcomes of this project for educating their constituents and enhancing their professional goals and objectives. The collaborative efforts with USDA/NIFA and the USDA/FS have made significant contributions toward addressing the challenges of the emerging biobased industry with outcomes that support research, development, demonstration, and pre-commercialization activities. The project has enhanced the graduate programs in urban forestry through students & faculty involvement, thesis & dissertation development, scholarly publications and community outreach & extension activities. Programs in urban forestry at SU have been positively enhanced based on the latest student learning outcome assessment conducted.

Through collaborative efforts with the GC-CESU and non-profit organizations we are impacting the restoration efforts in Louisiana, Mississippi and other neighboring states. Collaboration with the private sector & arboricultural companies has promoted the utilization of wood waste, especially the urban wood waste in Louisiana. Two assessment reports were produced. One new web-site was developed and enhanced. Six mulch formulations were developed (SUAREC M1-SUAREC M6) for testing.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources

124	Urban Forestry
132	Weather and Climate
133	Pollution Prevention and Mitigation
134	Outdoor Recreation
403	Waste Disposal, Recycling, and Reuse

Outcome #3

1. Outcome Measures

National Outcome #1: Development of new knowledge and technologies

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Ongoing economic struggle caused serious setback on the availability of funds. In FY 2013/14, State Appropriations were increased for the first time in almost six years. However, budget cuts were being proposed at year's end. Delays in Federal budget approvals continued to be of concern because the actual budget data were not readily available for effective planning. Government priority changes caused the relocation of some program participants resulting in decline in number of residents impacted. Additionally, Louisiana rural population continued to lag behind other 1890 states which resulted in the SU Ag Center receiving less federal formula funds. Furthermore, the continuing recovery by those who were relocated due to previous hurricanes (2005 and 2008) and the 2010 oil spill caused problems in the state and impacted outcomes.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}