

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Climate Change

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

| KA Code | Knowledge Area | %1862 Extension | %1890 Extension | %1862 Research | %1890 Research |
|---------|--|-----------------|-----------------|----------------|----------------|
| 101 | Appraisal of Soil Resources | 5% | | 15% | |
| 112 | Watershed Protection and Management | 15% | | 0% | |
| 132 | Weather and Climate | 10% | | 0% | |
| 136 | Conservation of Biological Diversity | 5% | | 5% | |
| 201 | Plant Genome, Genetics, and Genetic Mechanisms | 0% | | 15% | |
| 202 | Plant Genetic Resources | 0% | | 5% | |
| 203 | Plant Biological Efficiency and Abiotic Stresses Affecting Plants | 0% | | 15% | |
| 205 | Plant Management Systems | 35% | | 0% | |
| 206 | Basic Plant Biology | 0% | | 15% | |
| 403 | Waste Disposal, Recycling, and Reuse | 5% | | 20% | |
| 404 | Instrumentation and Control Systems | 10% | | 10% | |
| 804 | Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures | 15% | | 0% | |
| | Total | 100% | | 100% | |

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

| Year: 2010 | Extension | | Research | |
|------------|-----------|------|----------|------|
| | 1862 | 1890 | 1862 | 1890 |
| Actual | 25.1 | 0.0 | 7.3 | 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 |
| 474257 | 0 | 944181 | 0 |
| 1862 Matching | 1890 Matching | 1862 Matching | 1890 Matching |
| 4742570 | 0 | 944181 | 0 |
| 1862 All Other | 1890 All Other | 1862 All Other | 1890 All Other |
| 2141496 | 0 | 986609 | 0 |

V(D). Planned Program (Activity)

1. Brief description of the Activity

Specific subject matter areas and programs included in this initiative are:

- Animal waste handling and utilization
- Water quality
- Environment and natural resources
- Sustainable housing
- Wetland plants
- Louisiana Master Farmer Program

Activities include extension outreach using group and individual methods and mass media, research experiments; result demonstrations; and field days, all incorporating the latest technological advances and use of social media.

2. Brief description of the target audience

Coastal managers, Louisiana wetlands stakeholders, commercial and recreational fishermen, participants in the Louisiana Master Farmer and Master Cattle Producer programs, other agricultural producers, livestock producers and Louisiana homeowners, builders and retrofitters.

V(E). Planned Program (Outputs)

1. Standard output measures

| 2010 | Direct Contacts Adults | Indirect Contacts Adults | Direct Contacts Youth | Indirect Contacts Youth |
|---------------|------------------------|--------------------------|-----------------------|-------------------------|
| Plan | {NO DATA} | {NO DATA} | {NO DATA} | {NO DATA} |
| Actual | 76999 | 15462 | 42516 | 473 |

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

Patent Applications Submitted

Year: 2010

Plan:

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

| 2010 | Extension | Research | Total |
|--------|-----------|----------|-------|
| Actual | 4 | 39 | 43 |

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of individuals who toured LaHouse

| Year | Target | Actual |
|------|-------------------|--------|
| 2010 | {No Data Entered} | 2565 |

Output #2

Output Measure

- Number of building professionals involved in LaHouse educational events

| Year | Target | Actual |
|------|-------------------|--------|
| 2010 | {No Data Entered} | 1700 |

Output #3

Output Measure

- Number of consumers involved in LaHouse educational events

| Year | Target | Actual |
|------|-------------------|--------|
| 2010 | {No Data Entered} | 3000 |

Output #4

Output Measure

- Number of Web page views

| Year | Target | Actual |
|------|-------------------|---------|
| 2010 | {No Data Entered} | 2782733 |

Output #5

Output Measure

- Number of Web page visits

| Year | Target | Actual |
|-------------|-------------------|---------------|
| 2010 | {No Data Entered} | 2341887 |

Output #6

Output Measure

- Average number of energy-saving measures adopted by consumer audiences

| Year | Target | Actual |
|-------------|-------------------|---------------|
| 2010 | {No Data Entered} | 14 |

Output #7

Output Measure

- Average number of building practices adopted by building and retrofitting professionals

| Year | Target | Actual |
|-------------|-------------------|---------------|
| 2010 | {No Data Entered} | 7 |

Output #8

Output Measure

- Number of farmers certified through the Louisiana Master Farmer program

| Year | Target | Actual |
|-------------|-------------------|---------------|
| 2010 | {No Data Entered} | 9 |

Output #9

Output Measure

- Number of additional educational publications produced

| Year | Target | Actual |
|-------------|-------------------|---------------|
| 2010 | {No Data Entered} | 33 |

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

| O. No. | OUTCOME NAME |
|--------|--|
| 1 | Reduce the impact of animal waste on the environment. |
| 2 | Increased adoption of high performance building and retrofitting practices. |
| 3 | Determine ways to reduce the impact of animal waste on the environment through research discovery and development. |
| 4 | Increased adoption of recommended practices to reduce non-point source pollution in Louisiana waterways. |
| 5 | Increased coordination of research and extension activities to address environment and natural resource concerns across the southeastern US. |
| 6 | Reduce coastal erosion through the establishment of viable wetland plants. |

Outcome #1

1. Outcome Measures

Reduce the impact of animal waste on the environment.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

| Year | Quantitative Target | Actual |
|-------------|----------------------------|---------------|
| 2010 | {No Data Entered} | 0 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

More than 280,000 tons of animal and poultry waste are produced in Louisiana each year. Producers must handle this waste in an environmentally-friendly manner to minimize the potential negative effects waste can have on waterways. Animal wastes improperly applied to or stored on land can lead to runoff that can reduce surface and groundwater quality by introducing excessive levels of nutrients such as nitrogen and phosphorus, organic matter and pathogens into the environment.

What has been done

Educational efforts and field trials have addressed the effectiveness of implementing environmental best management practices to minimize the effects of production animal agriculture on water quality. Research based information has been used to conduct field studies to evaluate proper manure/litter application rates while reducing nutrient runoff. Producers have been educated about composting ag byproducts through individual contacts and group meetings.

Results

Livestock and poultry producers improved waste management through using best management practices for soil and manure/litter analyses to develop, implement, and use nutrient management plans. Environmental stewardship, environmental best management practices, air quality, and nutrient abatement educational efforts were conducted for equine, beef, dairy, poultry, and other animal agriculture producers. By following research-based extension recommendations, animal producers stored manure and litter according to recommendations, applied poultry litter and manure at recommended rates and times, and reestablished riparian zones.

4. Associated Knowledge Areas

| KA Code | Knowledge Area |
|----------------|-----------------------|
|----------------|-----------------------|

112 Watershed Protection and Management
403 Waste Disposal, Recycling, and Reuse

Outcome #2

1. Outcome Measures

Increased adoption of high performance building and retrofitting practices.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

| Year | Quantitative Target | Actual |
|-------------|----------------------------|---------------|
| 2010 | {No Data Entered} | 0 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The need for energy efficiency to reduce dependence on non-renewable energy, environmental preservation and pollution prevention, disaster mitigation, family health, safety and economic stability, and state and community economic recovery are driving educational efforts in sustainable housing.

What has been done

The LaHouse Resource Center (lsuagcenter.com/LaHouse) is an educational attraction that serves to demonstrate high performance building and retrofitting practices. Technical assistance was provided to 9 builders for demo homes; and more than 100 educational activities, including workshops, consumer seminars, CEU seminars, and conferences were conducted. A regional "Building Your High Performance Home" book was produced; and 100+ online articles, photos, Online Training Center (videos, courses) were posted to the LaHouse Web site which drew 800-1300 visits/month.

Results

Consumer audiences adopted avg. of 14 energy-saving practices and 82% were willing to invest >5% more for energy efficiency. Mean knowledge level rose from 1.5 to 3.2 on 5-point scale. *LaHouse consumer audience is projected to annually save: 120,800 million Btu's; \$2.23 million; 81,900 lbs. SO₂, 55,900 lbs. NO₂, and 22,300 tons of CO₂ emissions. Housing pro audience adopted an average of 7 building practices. Mean knowledge rose from 3.2 to 4.1. Builders planned to build an average of 12 high-performance homes/year. *Technical audience is projected to annually save: 42,700 million Btu's; \$1.57 million; 75,000 lbs SO₂, 41,000 lbs. NO₂, and 12,700 tons CO₂ emissions. (*Estimates of potential program impact are based on survey

results, FY10 audience numbers and energy modeling software analyses of a benchmark house and savings from adoption rates.)

4. Associated Knowledge Areas

| KA Code | Knowledge Area |
|---------|--|
| 804 | Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures |

Outcome #3

1. Outcome Measures

Determine ways to reduce the impact of animal waste on the environment through research discovery and development.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

| Year | Quantitative Target | Actual |
|------|---------------------|--------|
| 2010 | {No Data Entered} | 0 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Animal waste handling and utilization presents a challenge to producers. While manure can be source of nutrients in agricultural operations, its delivery can be unreliable, potentially pollutant and often uneconomical for farmers. Louisiana waters are reported as impaired because of agricultural runoff. Methane, nutrients and pathogens released from manure are among the leading causes of environmental contamination. Improved manure handling and application methods need to be developed.

What has been done

Issues were addressed from animal waste and soil remediation perspectives. Studies evaluated ways to optimize nutrients in animal feeds. Economic value of manure nutrients and transportation viability were examined in support of cost-sharing programs. Enhanced treatment systems were evaluated as alternatives or in addition to single lagoons. Field studies evaluated proper waste application and soil remediation to reduce leaching while keeping the land productive.

Results

Studies demonstrated that dairy cows can maintain high productivity without phosphorus supplements and that nitrogen loss to the environment from swine and poultry can be minimized

using supplemental amino acids. The use of in-house pasteurization of broiler litter has been beneficial to broiler producers and reduced the amount spread on land. Wastewater recycling for nutrients alone is cost-prohibitive for most dairy producers, but estimates showed that a 75% cost-sharing program would ensure proper manure disposal. More than 148 lagoons were pumped onto agricultural land since 2001 with the aid of the local NRCS cost-sharing program. Animal Feeding Operations can also use sequential treatment to remove pollutants. Pathogen dynamics studied suggest wildlife contamination of wastewater may significantly increase E. coli count. Strains of E. coli were shown to have different survivability and their reasons are being investigated. Biofuel crops were investigated for soil bioremediation.

4. Associated Knowledge Areas

| KA Code | Knowledge Area |
|---------|--------------------------------------|
| 112 | Watershed Protection and Management |
| 403 | Waste Disposal, Recycling, and Reuse |
| 404 | Instrumentation and Control Systems |

Outcome #4

1. Outcome Measures

Increased adoption of recommended practices to reduce non-point source pollution in Louisiana waterways.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

| Year | Quantitative Target | Actual |
|------|---------------------|--------|
| 2010 | {No Data Entered} | 0 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Over 70 percent of LA's waterways are listed on EPA's 303d list as impaired and not suitable for fishing or swimming. Many of these impairments are thought to result from non-point pollution emanating from watershed land use practices such as agriculture, forestry, individual sewage treatment, home landscape, construction and other urban and suburban conditions.

What has been done

LSU AgCenter continued its Master Farmer Program to educate landowners and encourage adoption of BMPs to mitigate runoff from various land use. Other programs: educate and

encourage dairymen to empty lagoons on a 3-5 year rotation; conduct research and extension outreach on lagoon design systems; and educate homeowners and municipalities about runoff control. Research continued on a variety of new BMPs that reduce impact of added agricultural chemicals on water quality.

Results

LA Master Farmer Program includes an intensive 8 hours of environmental classroom instruction, visits to model farms and implementation of required BMPs to gain certification from the Louisiana Department Agriculture and Forestry. Over 2,700 farmers who control or own over 1M acres in LA are enrolled in this program. This year 9 farmers were certified and 124 farmers are currently certified which means they have met criteria to protect soil, water animals, plants, and air. Other applied research and extension programs on animal waste and homeowner issues resulted in the Tangipahoa River, an important economic waterways that runs through one of Louisiana's most populated areas and through the states' highest dairy production area, being de-listed by EPA and DEQ from the 303d list and is now open for fishing and swimming. Two other river segments in the area are scheduled to be removed from the list this year.

4. Associated Knowledge Areas

| KA Code | Knowledge Area |
|---------|--------------------------------------|
| 101 | Appraisal of Soil Resources |
| 112 | Watershed Protection and Management |
| 132 | Weather and Climate |
| 205 | Plant Management Systems |
| 403 | Waste Disposal, Recycling, and Reuse |

Outcome #5

1. Outcome Measures

Increased coordination of research and extension activities to address environment and natural resource concerns across the southeastern US.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

| Year | Quantitative Target | Actual |
|------|---------------------|--------|
| 2010 | {No Data Entered} | 0 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The wellbeing of Louisiana depends on its resource-based economy. The state's natural capital assets must be efficiently managed for both current and future generations. Resource management includes wise use and careful analysis of allocation decisions made today and their potential impacts. While research and extension efforts related to natural resource conservation, use, and management have increased in recent years, efforts have been fragmented and widely dispersed.

What has been done

The Center for Natural Resource Economics & Policy (CNREP) is a team of economists and policy professionals that coordinate the research and extension activities of natural resource management at LSU and other institutions in the southeastern US. The new center is helping Louisiana meet resource management challenges by engaging and supporting research and extension faculty in socioeconomic initiatives related to energy, coastal & inland wetlands, fisheries, wildlife, land, and water resources.

Results

Center membership has grown to 26 faculty from 12 universities & resource management agencies throughout the SE U.S. Examples of specific impacts include: 225 people from 20 US states and 9 countries attended the 3rd national CNREP conference on climate change (www.cnrep.lsu.edu). A new technique for estimating the economic impacts of natural disasters continues to be refined. The research has provided economic justification for more than \$250M in recovery funding and the guidance for distributing these funds to more than 2000 fishing businesses. CNREP economists implemented several applied research projects related to coastal wetland management & restoration. These studies have been developed with public agencies and used to improve the allocation efficiency of restoration in support of \$89M in marsh creation projects authorized in 2010.

4. Associated Knowledge Areas

| KA Code | Knowledge Area |
|----------------|-------------------------------------|
| 112 | Watershed Protection and Management |
| 132 | Weather and Climate |

Outcome #6

1. Outcome Measures

Reduce coastal erosion through the establishment of viable wetland plants.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

| Year | Quantitative Target | Actual |
|------|---------------------|--------|
| 2010 | {No Data Entered} | 0 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Wetland deterioration caused by climate change and/or human activities plagues the Northern Gulf of Mexico Basin, especially Louisiana. Louisiana's coastal plains are the largest expanse of wetlands in the contiguous United States and one of the world's most significant wetland areas. The long term social, environmental, and economic consequences of extensive wetland loss affect our nation's security. Individual states and the nation are deprived of wetland-related economic and environmental benefits.

What has been done

The LSU AgCenter developed the Coastal Plants Program, a long-term, multi-disciplinary, and multi-institutional program of coastal plant research. The Coastal Plants Program's mission is to develop genetically improved plant varieties and applied restoration techniques to combat wetland deterioration. The Coastal Plants Program also exchanges information through a cooperative research and extension program, which supports an expanded group of Louisiana wetland stakeholders.

Results

The Coastal Plants Program (CPP) identified 16 cultivars to be released for vegetative and wildlife restoration: 6 *Spartina alterniflora*, 4 *Uniola paniculata*, and 6 *Schoenoplectus californicus*. LSU AgCenter extension agents educate the public regarding restoration plant availability and cultivation. Genetically distinct cultivars are needed in restoration projects because of their capacity to adapt to changes due to environment, climate, or human activities. The CPP has also established *S. alterniflora* using seeds that were distributed via aerial application to remote or inaccessible sites. The CPP developed methodologies for large-scale seed production of *S. alterniflora* and technologies, such as seed coatings, to increase the success of aerial application. Seed coatings increased seed weight, which theoretically increases the chances that seeds anchor into marsh soil allowing large areas of endangered coastal marshes to be restored inexpensively with seeds.

4. Associated Knowledge Areas

| KA Code | Knowledge Area |
|---------|--|
| 101 | Appraisal of Soil Resources |
| 112 | Watershed Protection and Management |
| 132 | Weather and Climate |
| 201 | Plant Genome, Genetics, and Genetic Mechanisms |
| 205 | Plant Management Systems |
| 206 | Basic Plant Biology |

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

The Gulf oil spill and the state's plummeting economy significantly influenced the LSU AgCenter's program direction during FY2010. Competition for limited resources and competing public priorities resulted in a shifting of programmatic efforts to address the most pressing needs of Louisiana residents.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

Key Items of Evaluation