V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Climate Change and Natural Resources

☑ 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
101	Appraisal of Soil Resources	5%	0%	0%	
102	Soil, Plant, Water, Nutrient Relationships	5%	0%	0%	
103	Management of Saline and Sodic Soils and Salinity	5%	0%	0%	
104	Protect Soil from Harmful Effects of Natural Elements	5%	0%	0%	
111	Conservation and Efficient Use of Water	10%	10%	0%	
112	Watershed Protection and Management	10%	0%	0%	
121	Management of Range Resources	5%	0%	0%	
122	Management and Control of Forest and Range Fires	5%	0%	0%	
123	Management and Sustainability of Forest Resources	5%	10%	0%	
124	Urban Forestry	5%	80%	0%	
125	Agroforestry	5%	0%	0%	
131	Alternative Uses of Land	5%	0%	0%	
132	Weather and Climate	5%	0%	0%	
133	Pollution Prevention and Mitigation	5%	0%	0%	
134	Outdoor Recreation	5%	0%	0%	
135	Aquatic and Terrestrial Wildlife	5%	0%	0%	
136	Conservation of Biological Diversity	5%	0%	0%	
141	Air Resource Protection and Management	5%	0%	0%	
	Total	100%	100%	0%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	4.0	1.0	0.0	0.0
Actual Paid	88.9	1.3	0.0	0.0
Actual Volunteer	0.0	140.0	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**
964965	197369	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
964965	186975	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

1. In service training workshops will be developed using research-based information

2. A centralized website will be implemented (as a component of the Florida Climate Institute's website) containing:

• Resource library of internally vetted articles, government documents, lectures, NGO reports and links to websites

• List and links to existing UF/FSU research programs related to climate variability and change

• In-service training presentations

• Extension curriculum materials (PowerPoint presentations, EDIS publications, other resources)

• Funding opportunities, especially via RFPs which require an Extension component

3. EDIS publications targeting specific sectors, needs assessment reports, and risk assessments for specific industries and geographies

2. Brief description of the target audience

Potential partners include the Florida Climate Institute, the Southeast Climate Consortium, UF Water Institute, Florida's Water Management Districts, NOAA-Sea Grant Program, FL Fish and Wildlife Conservation Commission, Florida Exotic Pest Plant Council, and others.

Target audience includes all UF/IFAS Extension professionals and stakeholders.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	914948	2177427	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	146	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Change in knowledge related to climate variability and climate change
2	Change in behavior related to climate variability and climate change
3	Change in condition related to climate variability and climate change
4	Increased partnerships with Green Industry professionals.

Outcome #1

1. Outcome Measures

Change in knowledge related to climate variability and climate change

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	41272

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Florida citrus growers and production managers can?t grow citrus successfully and competitively without supplemental irrigation. Supplemental irrigation is necessary in Florida because of the non-uniform distribution of the rainfall and the very limited water holding capacity of sandy soils. With proper irrigation scheduling, tree growth and fruit yield will not be limited by water stress or water excess.

What has been done
Educational programs on water management to conserve water and protect water quality have been conducted (148 attendees). All participants increased their knowledge on the importance of well-designed, uniform irrigation systems, accurate irrigation scheduling and proper irrigation system maintenance that would increase irrigation efficiency and uniformity, and minimize waste.

Results
From data provided by participants, adequately maintaining the uniformity of their irrigation systems and properly scheduling their irrigation, growers saved approximately 10% of the water allocated to them, 10% of pumping energy, and 10% of their water management cost. Using an estimated cost of $200 per acre per year for irrigation, a 10% savings would be approximately (200 x 10% x 125,234 acres) $2,505 million per year in SW Florida and (200 x 10% x 515,147 acres) $10,303 million per year in the state of Florida.

4. Associated Knowledge Areas

KA Code	Knowledge Area

111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
132	Weather and Climate
133	Pollution Prevention and Mitigation

Outcome #2

1. Outcome Measures

Change in behavior related to climate variability and climate change

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	6655

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Florida?s water resources are at risk for pollution due to distinctive geologic features, climate and population pressures. According to the Florida Department of Environmental Protection, more than 60 percent of nonpoint source pollution comes from diverse sources such as fertilizer and pesticide runoff from farms, suburban and urban landscapes The Green Industries-Best Management Practices (GI-BMP) training program was developed by the Florida Department of Environmental Protection and endorsed by the pest control industry. Input from industry owners and local UF/IFAS Extension Agents identified Haitian Creole-speaking workers as an underserved audience.

What has been done
Input from industry owners and local UF/IFAS Extension Agents identified Haitian Creole-speaking workers as an underserved audience. The Green Industries Best Management Practices (GI-BMP) Creole Training Program included translating class materials; procuring funding; recruiting instructors; building partnerships between Florida-Friendly Landscaping (FFL), Florida Department of Environmental Protection (FDEP), UF/IFAS Extension Agents and Specialists, industry owners, and University of Florida translators for this target audience. GI-BMP programing increases landscape professional knowledge about landscape design, installation and nutrient and irrigation management practices thus minimizing potential negative environmental

impacts associated with nonpoint source pollution, and conservation of Florida?s natural resources. 1,340 training classes have been provided in English, Spanish or Haitian-Creole.

Results
The program has trained/certified over 36,000 industry professionals. Passing rates for in-person training are 92% for programs held in English, 80% for Spanish (80%) and 72% for Haitian-Creole. Participants completed an end-of-training evaluation with 84% indicating willingness to adopt BMPs and 79% saying they will use recommended fertilizer rates and methods. Nearly all indicated they alway or often "consider responsible use of water essential to reducing nutrient runoff and/or leaching," "consider over-irrigation harmful to plant and environment," and "use necessary precautions when applying pesticides near water bodies."

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
132	Weather and Climate
133	Pollution Prevention and Mitigation
136	Conservation of Biological Diversity

Outcome #3

1. Outcome Measures

Change in condition related to climate variability and climate change

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	2605

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The Florida Legislature passed the 1999 Florida Watershed Restoration Act, which gives the Florida Department of Agriculture and Consumer Services (FDACS) the authority to develop

interim measures, best management practices (BMPs), and other measures (e.g., cost-share incentives and other technical assistance programs) to assist agriculture in protecting Florida?s water resources.
In 2013, UF/IFAS created 10 watershed BMP teams to address water quality and quantity issues facing the agricultural industry. Educational programs were developed to cover topics such as irrigation efficiencies, nutrient application and efficiencies, soil testing, conservation techniques, and runoff reduction.

What has been done
Seminars, field days, workshops, and demonstrations have been conducted to assist some of the 44,000 commercial farmers on more than nine million acres in Florida. A website (http://bmp.ifas.ufl.edu/) also has been established to provide meeting schedules, presentations, published works, and other information to help growers. Benefits of this program include protecting water resources, improving chemical management, and increasing overall sustainability of the system.
Partners on this project are FDACS (funding), Farm Bureau, Nature Conservancy, Water Management Districts, and Mosaic. The target audience is growers. Extension assembled field-sensor kits for farmers, using commercially available including a fiberglass enclosure mounted on a pole, datalogger, cell phone modem and antenna, 12-volt battery, solar panel, tipping-bucket rain gauge, and soil moisture sensor. Potatoes grown in the Tri-county Agricultural Area (TCAA) traditionally have been fertilized in part by pre-plant broadcast applications. UF/IFAS on-farm research has demonstrated the value of banding fertilizer into each row of potatoes. UF/IFAS on-farm research demonstrated the value of banding fertilizer into each row of potatoes. UF/IFAS held a 2014 workshop on improving irrigation efficiency in container nursery operations that was attended by 38 nursery growers from five counties in central Florida.

Results
One farmer reported elimination of four 1-inch irrigation events on 180 acres through use of the field-sensor kit technology. This resulted in water savings of 19 million gallons and reduced pumping costs by about $5,000. Potatoes grown in the Tri-county Agricultural Area (TCAA) traditionally have been fertilized in part by pre-plant broadcast applications. Through banding techniques for potatoes, fertilizer applications have been reduced by about 25 percent. More than 30 percent (6,000 acres) of the potato acreage in the TCAA has converted from broadcast to banding. In a six-month follow-up survey done for the 2014 workshop for nursery growers, 73% reported changing production practices to increase irrigation efficiency and reduce the potential for fertilizer leaching.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management

Outcome #4

1. Outcome Measures

Increased partnerships with Green Industry professionals.

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
A local electric company requested that FAMU Extension give a class to its employees on tree management to help them provide a better service to their customers. This company had historically practiced poor urban forestry and arboriculture which both decreased aesthetics and created more dangerous situations.

What has been done
The focus of this program is to assist the green industry by providing training opportunities and credentialing practitioners seeking employment and advancement in the area of commercial and residential horticulture including arboriculture.

Results
After the two workshops, 100% of participants stated that they learned new information, and would make changes in the way they perform their job duties.

4. Associated Knowledge Areas

KA Code	Knowledge Area
124	Urban Forestry

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

Many parts of the state are still struggling due to the economy. This leads to greater numbers of people in need of help. Controversial issues such as climate change and GMOs take additional time and care when building relationships and trust with clientele, partners, and other stakeholders. Cuts to the university budget in year's past continue to have some impact. We are in the process of evaluating our Extension staffing needs statewide to ensure we are using our human resources most efficiently.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

UF and FAMU's key evaluations, both quantitative and qualitative, are reported under the State Defined Outcomes section. Ideally, we would like to have statewide data on more focused, key indicators.UF/IFAS is currently working on an "Extension Toolbox" in Qualtrics that will store common survey instruments and questions for all our major planned programs to be used by UF and FAMU Extension county faculty and state specialists. This will greatly improve our ability to gather statewide data on climate change, including the NIFA preferred indicators for this area: 1) the number of new animal breeds and crop varieties and genotypes with climate adaptive traits, 2) the number of participants that adopted recommended adaptation strategies for production agriculture and natural resources management, including invasive species, pest management, pollutant loads, and wetlands.

Key Items of Evaluation

No additional information to provide.