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
102	Soil, Plant, Water, Nutrient Relationships	10%	0%		
111	Conservation and Efficient Use of Water	5%	0%		
112	Watershed Protection and Management	2%	0%		
125	Agroforestry	2%	0%		
131	Alternative Uses of Land	2%	0%		
132	Weather and Climate	65%	0%		
205	Plant Management Systems	10%	0%		
211	Insects, Mites, and Other Arthropods Affecting Plants	2%	0%		
212	Pathogens and Nematodes Affecting Plants	2%	0%		
	Total	100%	0%		

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	1.0	0.0	0.0	0.0
Actual Paid Professional	0.1	0.0	0.0	0.0
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**
294	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
700	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
1989	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Planned program activities in this area will be multi-faceted to meet the needs of this diverse program area. Continuous interactions with stakeholders will provide information about their needs and concerns as related to climate change. This information will be used to develop Extension Team Projects - ETPs. The ETPs are individual programs that target specific areas of relevance and interest to a particular community, in this case agricultural and environmental communities around climate change aspects. Regional extension agents, county extension agents, and specialists are required to devote at least 50% of their Extension appointment directly to specific ETPs. Each participant is also required to file an annual report on their activities with those projects for which they are participants.

The main activities planned for this program are:

- Increase stakeholders (farmers, county and faculty extension specialists, consultants) literacy on climate variability and change. This will be achieved through in-service training sessions, multi-state conferences, workshops, development of news letter and extension bulletins, and participation in outreach activities.
- Evaluate at state level, climate change projections developed for the Southeast which will improve skill of summer and fall forecasts.
- Identification of potential adaptation strategies to reduce the impact of climate change on agricultural systems. This is expected to be achieved through in-service training sessions combined with panel discussions with participation of farmers, agribusiness representatives, commodity associations, cooperatives, water management districts, and county and state governments.
- Evaluation of changes in pest/diseases as consequence of climate change - Monitoring and management of row crops, fruits and vegetables pest education.
- Evaluation of changes in water resources as consequence of climate change - Education on monitoring and management of water resources.
- Evaluate the scenarios for agricultural trade at international/regional levels under different climate change scenarios to understand potential implications for agricultural and trade policy as a result of climate change.
- Development of Decision Support Systems.

2. Brief description of the target audience

The activities of the Climate Change Program Priority Team will target the following groups of stakeholders: 1) row crop and fruit-vegetable producers and their representatives groups that include, but are not limited to, the Alabama Cotton Commission, Alabama Peanut Commission, Alabama Soybean Producers, Alabama Wheat and Feed Grains Committee, and the AlabamaFruit and Vegetable Producers; 2) row crop and fruit-vegetable advisors including ACES agents and specialists, public and private crops advisors; 3) governmental agency personnel including USDA, NRCS, federal crop insurance and risk managers, and State of AlabamaSoil andWater Conservation Committee; 4) public policy makers requesting information that impact Alabama's agricultural and water resources communities, and 5) private citizens impacted by policies and practices used for the production of food, fuel, and fiber. All educational programming efforts will target audiences without exclusion or discrimination, as specifically defined by ACES policy guidelines.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	572	1670	0	0

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

Patent Applications Submitted

Year: 2011

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	2	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- - Distribution of basic information about climate variability and climate change not only for

Alabama but also for the Southeast. Most of the information will be related to differences between climate variability and change, maps of the average spatial variability of the most important climatic variables (e.g., rainfall and temperature), forecasts provided by US official weather service (NOAA). Several methods of notification (email-Timely Information Sheets, articles in popular press, climate variability/ climate change web site specifically designed for the program, etc) will be used to disseminate information. - Specific outputs include: 1) News and current information posted on the Climate web site as well as agronomic crops web site (www.alabamacrops.com).

Year	Actual
2011	22

Output #2

Output Measure

- - Meetings, in-service trainings, and workshops, will include information on the relationships between agriculture/natural resources and climate change as well as potential impacts, relationships between pest/diseases changes in relation to climate variability and climate change. - Specific outputs include: 1) Multi-state conferences on climate change and the implications for agriculture and natural resources, 2) In-service training meetings for target audiences (e.g., row crops producers, fruit and vegetable producers, soils and water conservationists, etc).

Year	Actual
2011	13

Output #3

Output Measure

- - Reports based on reviews of current knowledge about the relationships between agriculture and climate change and potential impacts.

Year	Actual
2011	1

Output #4

Output Measure

- - Recommendations for adaptation strategies for row crops/fruit and vegetables will be development to reduce the risks of climate variability and climate change. - Specific outputs include: a) Guidelines for agronomic management under various climate variability and climate change scenarios and b) Hard copy publications for use in production meetings and trainings where deemed appropriated.

Year	Actual
2011	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Members of the ACES Climate Change team will be required to provide a success story on an annual basis describing the program activity which they felt best demonstrated the impacts of their work. These success stories contain the following elements: a) why the program was conducted or the situation/problem that was addressed; b) specifically what and how it was done; c) the time period involved; d) the specific locations involved; e) who was impacted; f) how many people were served; and g) the final impacts. Short-term outcome: The most immediate outcomes are: 1) Increased understanding of the potential impacts of climate variability and climate change on row crops, fruits and vegetables;
2	2) Increased information about the impact of ENSO phases on row crops, fruits and vegetables;
3	3) Alabama stakeholders trained/educated in climate variability and climate change topics;
4	4) Alabama growers, extension agents and extension specialists trained in using agroclimatic decision support tools
5	5) Capacities strengthened for integrating climate change risks and opportunities into state and regional development assistance
6	6)Capacities strengthened to access and use resources effectively to reduce risks associated with climate variability and climate change
7	7) Capacities strengthened to understand and manage water or natural resources in the context of climate vulnerability
8	8) Identification of the most profitable row crops management practices by ENSO phase
9	9) Identification of adaptation strategies to reduce climate change impacts.
10	10) increased awareness of the impacts of climate on agricultural Production.
11	Medium-term outcomes: The medium-term outcomes of the Climate Change Extension Program are: 1) implementation of a new system of management practices for row crops and vegetables according to ENSO phase
12	2) Improved agronomic management row crops and vegetables
13	Long-term outcomes: The long-term outcomes of the Climate Change Extension Program are: 1) increased profitability of Alabama growers
14	2) improved soil conditions
15	3) reduced environmental impacts

16	4) competitive Auburn and ACES Agronomic Research, Extension and Education system.

Outcome #1

1. Outcome Measures

Members of the ACES Climate Change team will be required to provide a success story on an annual basis describing the program activity which they felt best demonstrated the impacts of their work. These success stories contain the following elements: a) why the program was conducted or the situation/problem that was addressed; b) specifically what and how it was done; c) the time period involved; d) the specific locations involved; e) who was impacted; f) how many people were served; and g) the final impacts. Short-term outcome: The most immediate outcomes are: 1) Increased understanding of the potential impacts of climate variability and climate change on row crops, fruits and vegetables;

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
A group of 7 farmers from Southeast Alabama for the last two years have been participating of the Tri-state climate working group for row crops in Agriculture. Based on the climate information and knowledge of impacts of seasonal climate vriability on agriculture, Myron Jhonson, a farmer located Headland, AL decided to change the average peanut planting date for an early planting date to avaiod water and heat stress on his peanut crop. Mr .Johnson harvested an excellent crop compared with yield losses by his neighbors whom used the standard plantign date

What has been done
The climate meetings with farmers have resulted in increased knowledge, changes in farmers' attitude respect to the benefits of using climate information to support management decisions, increased skills on how to use climate information and the sources of climate information.During the meetings of the Tri-state (AL, GA, FL) climate working groups the attendees have learned that ENSO is the main source of climate variability in the Southeast,differences between ENSO phases respect to climatic variables, the immpacts of ENSO on agriculture

Results

Increased yields/reduction of the risk for yield losses

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
132	Weather and Climate
205	Plant Management Systems

Outcome #2

1. Outcome Measures

2) Increased information about the impact of ENSO phases on row crops, fruits and vegetables;

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Information about the impact of ENSO phases on row crops, fruits and vegetables is important for farmers, govermental agencies, and agriculture policy makers. Seasonal climate variability could have detrimental or beneficial impacts on the production of crops and final yield, as well as water resources; therefore increased knowledge on ENSO and its impact is key to reduce potential negative impacts or to take advantage of favorable conditions for crop production.

What has been done
Information on changes on ENSO phases, transition between phases, changes in rainfall and temperature patterns associated with ENSO was distributed through various success: emails (1670 contacts/year), timely extension publications (1), ag climate outlooks (1), internet articles (3), press articles published in the Southeast Farm Press and Southwest Farm Press magazines (3), presentations and climate displays during farmers meetings, alabama fruit and vegetable annual meeting (Feb 2011), 2011 meeting of the Greater Birmingham association of landscape professionals, six conference abstracts were submitted to professional meetings, a workshop for

certified crop advisors on the use of climate decision support tools was organized (30 people).

Results
- Knowledge on ENSO and its relation with climate variability has been gained.
- Awareness has been raised on the impact of ENSO phases in row crops.
- Skills have been developed on differentiation between ENSO phases respect to seasonal changes in rainfall and temperature patterns.
- Skills have been developed on the use of Agroclimate tools (agroclimate.org) to support management decision on agriculture.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
132	Weather and Climate
205	Plant Management Systems

Outcome #3

1. Outcome Measures

3) Alabama stakeholders trained/educated in climate variability and climate change topics;

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1845

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Climate information to make educated management decisions and preparedness for conditions that might negatively impact food production is necessary in order to implement the most appropriate adaptation and mitigation strategies.

What has been done
Climate information has been distributed through: emails (1670 contacts/year), timely extension publications (1), agricultural climate outlooks (1), internet articles (3), press articles published in

the Southeast Farm Press and Southwest Farm Press magazines (3), presentations at farmers meetings (3 presenrations, 160 people). Presentations and climate displays at the alabama fruit and vegetable annual meeting (Feb 2011), 2011 meeting of the Greater Birmingham association of landscape professionals (75 people). One training on the use of climate-based decision support tools available on Agroclimate was organized for the Alabama Certified Crop Advisors(30 people).

Results
Stakeholders gained knowledge on the differentiation between ENSO phases, impact of ENSO on climatics variables, sources of climate information, and decision support tools avaialable on Agroclimate.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
132	Weather and Climate

Outcome #4

1. Outcome Measures

4) Alabama growers, extension agents and extension specialists trained in using agroclimatic decision support tools

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Knowledge on the use of climate-based decision support tools will increase the success for choosing the optimum management strategies accoording to the current climatic conditions. Trained extension agents and specialist will result in knowledge transfer to the Alabama stakeholders.

What has been done

- One training on the use of climate-based decision support tools available on Agroclimate was organized for the Alabama Certified Crop Advisors(30 people).
- Farmers and extension specialists attending the Tri-state climate working group have recieved information on the tools avaialable on Agroclimate.
- A timely information publication with title: "Climate Variability Associated with La Nina or El Nino phases: Introducing the Climate Risk Tool" was published.

- Articles published on the ACES web page: Using Climate Research to Build a More Nuanced Picture of Alabama Row-Crop Farming. ACES web page Blog (Nov 13, 2011);
- Two press articles published on the Southeast and Sothwest Farm Press managine. Title Knowledge of weather patterns is crop
management tool.

Results

- Awareness was raised on the climate-based decision support tools avaialable on Agroclimate.

- Knowledge gaining on the use of the Agroclimate Tools.

- Skills developed on how to retrive information from the Agroclimate tools.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
132	Weather and Climate

Outcome #5

1. Outcome Measures

5) Capacities strengthened for integrating climate change risks and opportunities into state and regional development assistance

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Nothing to report at this moment

What has been done
Nothing to report at this moment

Results
Nothing to report at this moment

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
132	Weather and Climate
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants

Outcome #6

1. Outcome Measures

6)Capacities strengthened to access and use resources effectively to reduce risks associated with 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
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Stakeholders and extension personnel are continuously using various sources of climate data and information to support management decisions. Therefore, an increase on the sources of climate information will result on better management decision and less food production risks associated to climate variability

What has been done
- The development of a Climate Extension web site was initialed in 2011 and it is expected to be accesible to the public in March 2012. The web site will include multiple resources or climate information.
- Trainings on the use of the tools available on the Agroclimate web site and on the use of other climate information web sites.

Results
- Knowledge on how to use the Agroclimate tools increased.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
132	Weather and Climate
205	Plant Management Systems

Outcome #7

1. Outcome Measures

7) Capacities strengthened to understand and manage water or natural resources in the context of climate vulnerability

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Nothing to report on this aspect

What has been done
Nothing to report on this aspect

Results
Nothing to report on this aspect

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
132	Weather and Climate
205	Plant Management Systems

Outcome #8

1. Outcome Measures

8) Identification of the most profitable row crops management practices by ENSO phase

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Changes in management practices (planting date, variety, irrigation, tillage, fertilizer - timing and rate) implemented by farmers might be necessary to reduce climate-related yield losses or to take advantage of favorable climate conditions for crops production. Identification of adaptation and mitigation strategies for coping with climate variability will increase food production security

What has been done
Multiple studies are being conducted to:
- Identify is wheat yield differences exist between ENSO phases. Historic yield data from the

Alabama Official variety trials conducted at seven research stations was used. Results showed that Wheat yield is higher under La Nina phase than El Nino phase.
- Identify the optimum site-specific planting date and wheat variety by ENSO phase. A experiment conducted at three different locations in Alabama has been conducted during the last two year. Preliminary results indicate that wheat yield decrease as the planting date is delayed. An interaction location by planting date by maturity was observed.
Results from these studies has been presented at wheat farmers meetings (145 farmers attending two wheat expo meetings), regional and national professional meeting.

Results
- Knowledge has been gained on the wheat yield differences by ENSO phase. Farmers, extension personnel and scientists from different institutions are aware of those results.
- Awareness has been raised on the wheat yield impact from changes on planting date and variety.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
132	Weather and Climate
205	Plant Management Systems

Outcome #9

1. Outcome Measures

9) Identification of adaptation strategies to reduce climate change impacts.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Nothing to report on this aspect

What has been done
Nothing to report on this aspect

Results
Nothing to report on this aspect

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
131	Alternative Uses of Land
132	Weather and Climate
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants

Outcome #10

1. Outcome Measures

10) increased awareness of the impacts of climate on agricultural Production.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Farmers and extension personnel including crop consultants are interested on the climate impact on food production. Increased awareness will result on the use of adaptation and mitigation strategies to cope with climate variability

What has been done
- Climate Information and climate impacts have been disseminated through email and internet, presented during farmers meetings, presented during professional meetings.

Results
Alabama farmers and extension are able to distinguish btween ENSO phases and relate those differences with the changes on climatic variables such as precipitation and temperature.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
132	Weather and Climate
205	Plant Management Systems

Outcome #11

1. Outcome Measures

Medium-term outcomes: The medium-term outcomes of the Climate Change Extension Program are: 1) implementation of a new system of management practices for row crops and vegetables according to ENSO phase

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Nothing to report on yet.

What has been done
Nothing to report on yet.

Results
Nothing to report on yet.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
131	Alternative Uses of Land
132	Weather and Climate
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants

Outcome #12

1. Outcome Measures

2) Improved agronomic management row crops and vegetables

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Nothing to report on yet.

What has been done
Nothing to report on yet.

Results
Nothing to report on yet.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
131	Alternative Uses of Land
132	Weather and Climate
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants

Outcome #13

1. Outcome Measures

Long-term outcomes: The long-term outcomes of the Climate Change Extension Program are: 1) increased profitability of Alabama growers

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Nothing to report in this aspect yet.

What has been done
Nothing to report in this aspect yet.

Results
Nothing to report in this aspect yet.

4. Associated Knowledge Areas

KA Code	Knowledge Area

102	Soil, Plant, Water, Nutrient Relationships
131	Alternative Uses of Land
132	Weather and Climate
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants

Outcome #14

1. Outcome Measures

2) improved soil conditions

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Nothing to report in this aspect yet.

What has been done
Nothing to report in this aspect yet.

Results
Nothing to report in this aspect yet.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
131	Alternative Uses of Land
132	Weather and Climate

205 Plant Management Systems

Outcome #15

1. Outcome Measures

3) reduced environmental impacts

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Nothing to report in this aspect yet.

What has been done
Nothing to report in this aspect yet.

Results
Nothing to report in this aspect yet.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
125	Agroforestry
131	Alternative Uses of Land
132	Weather and Climate

Outcome #16

1. Outcome Measures

4) competitive Auburn and ACES Agronomic Research, Extension and Education system.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done
Extension agents and specialists (about 1000 contacts per year) have been contacted by email with information related to climate variability, impacts of climate variability on agriculture and water resources. Articles have been prepared for various web sites which discuss of the importance on including climate information as part of the decision making process. Extension articles has been published on how to use specific climate-based tools included on the Agroclimate web site.

Results
- Increased knowledge on the sources of climate variability and impacts.
- Increase knowledge on the use of climate information and climate-based decision support tools

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
125	Agroforestry
131	Alternative Uses of Land
132	Weather and Climate

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

In several meetings, stakeholders have seen reluctant to discuss the topic of climate change. They even have suggested that the words "climate change' should be avoided while talking to farmers, instead use climate variablity or weather. Therefore, no much of climate change issues have been discussed.

The identification of management practices that could be used to reduce climate variablity impacts is still on the research phase. More research years are necessary to provide climate-based recomendations.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Evaluations (pre and post training) during the hand-on climate education activities showed: a) 100% of attendees recognized that identifying the differences between climate and weather is important for farm management, b) 92% of attendees feel that "growers can make changes to their farm management if they are provided with climate information before the growing season starts", c) 77% of attendees claimed " the use of Internet to get climate/weather information to assist in growing or marketing row crops or management or water resources", d) 62% have heard about Agroclimate.org through the annual certified crop adviser trainings organized by the Agronomy department at Auburn University; however, only until the 2011 trainings conducted none of them have used Agroclimate.org to look for climate information. Post trainings statistics indicated that: a) attendees either learned something new (38% of answers) or learned much (50% of answers), b) before the trainings the attendees have a moderate knowledge of the differences between weather and climate but after the trainings their knowledge increase to medium high (56%) and high (44%), c) before the trainings about 56% of the attendees did not know the differences between ENSO phases (El Nino or La Nina) but after the trainings 79% of them expressed to understand the differences between ENSO phases, d) before the trainings almost of the attendees were not aware of the spatial and temporal differences in precipitation between El Niño and La Niña for the state of Alabama but after the trainings 75% of them expressed to understand those differences, e) before the trainings 70% of the attendees were not aware of the climate-based decision support tools available in Agroclimate.org but after the

knowledge increase to medium high (50%) and high (50%). During production meetings the question about awareness of wheat yield differences between a cold-wet (El Nino phase) and warm-dry (La Nina) was formulated and 32% of attendees express have noticed yield differences between both season and express interest on receiving more information about climate impacts on crops production and yield.

Key Items of Evaluation

Evaluation allowed the identifcation of main topics of interest by the people attending climate education programs. This information allowed s to tailor the trainings based on their needs and interest. Also, helped us to identify what type of modifications on the climate-based decision support tools are required to make them more appealing to the users of more understandable to the users.

We will continue with the evaluations to assess changes in knowledge, awareness, attitudes and skills.