V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Climate Change - Preserving Water Quality of North Florida Watersheds

☑ 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
102	Soil, Plant, Water, Nutrient Relationships				35%
111	Conservation and Efficient Use of Water				35%
133	Pollution Prevention and Mitigation				30%
	Total				100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2012	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.0	6.0
Actual Paid Professional	0.0	0.0	0.0	5.0
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**
0	0	0	548420
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	0	274210
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

The activities during the fourth year of the planned program were: on-going investigation of soil and nutrient erosion study in the Mear's Farm; collection and analysis of soil samples; investigated effect of dammed ravines on aquatic insect communities and sampling and collection of aquatic insects

2. Brief description of the target audience

The target audience for the program include: crop producers in the Apalachicola River Watershed, soil and water conservation organizations and personnel, extension workers, and small and limited resource farmers within the basin.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2012	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	75	90	40	50

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

Patent Applications Submitted

Year: 2012

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2012	Extension	Research	Total
Actual	0	3	3

V(F). State Defined Outputs

Output Target

<u>Output #1</u>

Output Measure

- Inventory of land use/land cover patterns in the Apalachicola River Basin.

Year **Actual**

2012	2

Output #2

Output Measure

- Data on soil erosion and nutrient loss under irrigated and non irrigated conditions.

Year	Actual
2012	3

Output #3

Output Measure

- Baseline aquatic insects data on two major water streams in the basin.

Year	Actual
2012	2

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Information on changing land-use patterns in the Apalachicola River Watershed.
2	Comparison of soil erosion measurements by the Mesh-bag method and the simulation results of RUSLE (the Universal Soil Loss Equation).
3	Identification of best management practices for efficient management of soil, water and nutrients.
4	Improvements of stream ecosystems.

Outcome #1

1. Outcome Measures

Information on changing land-use patterns in the Apalachicola River Watershed.

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The Apalachicola River Basin is a part of the greater Apalachicola-Chattahoochee- Flint Basin comprising almost 20, sq miles spread in three states: Georgia, Alabama and Florida. The water demands have dramatically increased in the watershed due to: growing population around Atlanta, increase in irrigation acreage in mid-Georgia and marine and fisheries needs in Florida. An inventory of land use pattern will assist the decision makers in maintaining water sustainability in the region. Agriculture being the major user of the water resources, it is imperative that we understand and plan for the future needs and how they will be met.

What has been done
We are collecting land-use data generated by various state agencies within the tri-state area and identifying the information gaps. Also developing GIS-based data information to look at the land use/land -cover changes.

Results
Land-use/land-cover maps have been developed for the Apalachicola Watershed.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water

Outcome #2

1. Outcome Measures

Comparison of soil erosion measurements by the Mesh-bag method and the simulation results of RUSLE (the Universal Soil Loss Equation).

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The results of this study will generate quality field erosion data, which is valuable in developing scientific conservation policy and helpful to decision makers and farmers, because quality field soil erosion data is needed for reliable soil erosion models. Such models are the basis for soil and water conservation evaluations. A true field soil erosion data is of interest to farmers because they can judge for themselves the effects of a particular conservation practice.

What has been done
We surveyed and generated detailed landscape micro topographic (contour) map of the 163 acre Mears Farm in Marianna, Florida (peanut and cotton rotation). We conducted experiments using mesh bags and mesh sheets to study the redistribution of eroded soil and associated nutrient loss during rain events. Soil loss and soil redistribution amounts were calculated.

Results
We have generated detailed micro topographic maps of the study areas. According to the topo maps, we classified the areas in four erosion classes. The background information is critical to the mesh-bag method.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships

Outcome #3

1. **Outcome Measures**

Identification of best management practices for efficient management of soil, water and nutrients.

Not Reporting on this Outcome Measure

Outcome #4

1. **Outcome Measures**

Improvements of stream ecosystems.

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Public Policy changes
- Government Regulations
- Other (Suitable study site)

Brief Explanation

Over the 2011, the fields under study received 20-30% less rainfall. The crop residues left after harvesting of the peanut crop were minimal.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Our results show that the mesh-bag method can be successfully deployed to observe soil nutrient erosion under un-obstructed natural run-off field conditions of relatively large-scale field experiments. This is the first time a true field soil erosion technology has been developed to observe true soil erosion process in natural field conditions. The development of this technology will fill a significant gap in soil and water conservation science and will provide valuable information that has been unavailable in the past for the verification, validation and calibration of soil erosion models. The biological monitoring employed in this study may be effectively used in developing watershed protection and ecosystem management strategies.

Key Items of Evaluation

The mesh-bag method to estimate soil erosion under irrigated and non-irrigated conditions provides valuable information regarding the redistribution of top soil.

The EPT (Ephemeroptera, Plecoptera, Tricoptera) Aquatic Index may be used to determine the water quality status of freshwater streams in a watershed.