V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Water Quality and Water Quantity

☑ 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
111	Conservation and Efficient Use of Water	30%	0%	10%	30%
112	Watershed Protection and Management	30%	0%	50%	20%
131	Alternative Uses of Land	5%	0%	0%	20%
133	Pollution Prevention and Mitigation	30%	0%	40%	20%
134	Outdoor Recreation	5%	0%	0%	10%
	Total	100%	0%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	8.0	1.0	4.4	1.0
Actual Paid Professional	9.0	0.0	3.2	1.0
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
312362	0	295146	187344
1862 Matching	1890 Matching	1862 Matching	1890 Matching
312362	0	334039	146990
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

Over 435 water quality and quantity and water resource educational programs were conducted by Extension reaching over 9,035 people such as students, from elementary to college, USDA Forest Service staff, governing boards for local municipalities and community organizations. Faculty collected water samples from burned sites for analysis for the USDA Forest Service Forested Wetland Center and discussed the impacts of forest fire on water quality. They conducted a study for the National Park Service about the impacts of microplastics on the health of wildlife and environmental qualities. A design was produced for a rock weir in a drainage ditch for the Horry County Storm water Management Program. Fifteen water quality and/or quantity best management practices were installed as demonstrations and over 2,300 pounds of trash were removed from regional waterways. In an effort to help better protect South Carolina's natural resources, Clemson University's Home and Garden Information Center has launched a fact sheet series called H2Ownership that provides solutions to today's water resource challenges. The series is available as a free download from the website. Agents educated the public on how their land-use practices impact the quality and quantity of water in streams. Agents and specialists developed and delivered educational programming on stream restoration and water quality protection; trained county volunteers to deliver water quality programming; designed, demonstrated and promoted the installation of riparian buffers and other environmentally appropriate plantings to protect water quality; and promoted environmentally sound natural resource recreation and tourism opportunities in South Carolina.

Field research focused on toxicity of metals and pesticides and on TMDL watershed modeling. Researchers establish an environmental radiochemistry lab, conducted a literature investigation on groundwater radionuclides in the Edisto River Basin, collected about 60 groundwater samples and conducted analyses.

We continue to conduct research and expand applications for the Intelligent River remote sensing technology in the Savannah river and in adjoining watersheds. Mercury in water was studied, bacterial and sediment impacts were evaluated associated with recreational trails on water quality of stream ecosystems, and the impact of urbanization on flow and sediment regimes in coastal watersheds.

An 1890 research project has characterized, remediated, managed and monitored the Edisto River mercury contaminated water and sediments in place and assessed the processes that govern ecological and human health risks. We established an Environmental Research and Teaching Lab in the Science and Engineering Complex. Researchers continued to review literature and collect existing field measurement data and site characterizaton information. Researchers searched and tested existing numerical modeling codes with different computer language for future modification and development.

2. Brief description of the target audience

The target audience includes landowners, Extension agents, and administrators, natural resource professionals, land management agency personnel and user groups, nature-based tourism operators/industry, South Carolina citizens, tourists, children in school, after-school, summer and 4-H programs, agents and volunteers, urban, suburban and rural residents, farmers, ranchers, poultry and swine producers, foresters urban agents, agency personnel, urban planners and land owners/managers, municipal officials, and local community groups statewide, managers, government officials and recreation and tourism operators.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	12435	752755	0	0

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

Patent Applications Submitted

Year:	2013
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	0	22	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Disclosures

Year	Actual
2013	0

Output #2

Output Measure

- Licenses

Year	Actual

2013	0

Output #3

Output Measure

- Number of people completing educational workshops

Year	Actual
2013	9039

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of people gaining knowledge.
2	Number of people using practices learned.
3	Number of people gaining knowledge and using practices to improve water quality and quantity.

Outcome #1

1. **Outcome Measures**

Number of people gaining knowledge.

Not Reporting on this Outcome Measure

Outcome #2

1. **Outcome Measures**

Number of people using practices learned.

Not Reporting on this Outcome Measure

Outcome #3

1. **Outcome Measures**

Number of people gaining knowledge and using practices to improve water quality and quantity.

2. **Associated Institution Types**

- 1862 Extension

3a. **Outcome Type:**

Change in Action Outcome Measure

3b. **Quantitative Outcome**

Year	Actual
2013	9039

3c. **Qualitative Outcome or Impact Statement**

Issue (Who cares and Why)
Water resources are vital to communities in South Carolina, especially in tourist regions. While water resources seem to be abundant in these regions of the state, many of the rivers and beaches are suffering from impaired water quality largely from non-point pollution from urban runoff. This program will promote the use of Best Management Practices for water quality and quantity.

What has been done
Some 435 programs were conducted reaching 9,035 people. Water quality and/or quantity best

management practices (including rain gardens, rain barrels, storm drain marking)were taught and/or installed as demonstrations. Certified Erosion Prevention and Sediment Control Inspector courses were conducted to educate field personnel on the proper installation, maintenance, and inspection of erosion prevention and sediment control measures at construction sites. These courses generated over $40,765 in externally derived revenue, which was used to pay graduate student stipends, travel, equipment, and supplies. Over 5,000 people have successfully completed the certification examination.
The South Carolina Water Resources Conference, which is coordinated by the Clemson University Center for Watershed Excellence (www.clemson.eduwatershedcenter) in conjunction with a statewide planning committee, included state level stakeholders and legislators. The conference provided an integrated forum for discussion of water policies, research projects and water management in order to prepare for and meet the growing challenge of providing water resources to sustain and grow South Carolinas economy, while preserving our natural resources.
Waste Water Treatment (Septic) System Training was conducted to reduce the incidence of septic system failure by increasing homeowner knowledge about how to properly use and maintain their onsite wastewater treatment system.

The Clemson University Home and Garden Information Center has launched a fact sheet series called H2Ownership that provides solutions to water resource challenges. The series is available as a free download from the website: http://www.clemson.edu/public/carolinaclear/

Results
Of those persons completing programs, 8,766 (97%) gained knowledge. The municipal attendees indicated that the information they acquired will be used in amendments to regulations, practices, and zoning ordinances. Over 2,300 pounds of trash were removed from regional waterways.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation
134	Outdoor Recreation

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

Federal permit regulations administered by the state, require that all inspectors participate in a recertification course before their initial certification expires. CEPSCI recertification required the development of a new curriculum, which took into account changes to the regulations, along with updates to structural best management practices, strategies for effectively completing inspection forms, and understanding emerging topics that will potentially affect permit compliance in the future.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Course evaluations have indicated an overwhelmingly positive response to curriculum modifications.

Evaluation results of the Onsite Waste Water Treatment (Septic) System Training, photos and full agenda can be supplied upon request: httpwww.clemson.eduwateshedcenterseptictraining.html.

Key Items of Evaluation