2009 University of Rhode Island Combined Research and Extension Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

In this report we describe the activities and impacts of programs associated with the Rhode Island Agricultural Experiment Station (RI AES or Station) and Rhode Island Cooperative Extension (RI CE or Extension); collectively referred to as the Land Grant programs. RI AES and RI CE are collaborative elements within the College of the Environment and Life Sciences (CELS) at the University of Rhode Island. Administrative oversight of RIAES and RICE is provided by the Dean of CELS. Day to day management of the Land Grant programs is provided by the Associate Dean, Research and Outreach.

The programs and projects supported within our Land Grant portfolio spans a wide range of disciplines, from the natural sciences to the social sciences. Equally important, the solutions that we share with stakeholders are based upon solid university research; research that depends on appropriate, modern infrastructure; the cutting edge tools of science; and multidisciplinary, multistate, problem-based approaches. The Land Grant programs are focused around a portfolio of 15 programs that include: 1) *Food Safety*, 2) *Nutrition, Health and Obesity Prevention*, 3) *Food Insecurity and Nutrition in Vulnerable Populations*, 4) *Children, 4-H and Families*, 5) *Sustainable Communities*, 6) *Vector Borne Diseases and Human Health*, 7) *Aquaculture Biotechnology*, 8) *Water Quality, 9) Forestry and Wildlife*, 10) *Community Gardening and Outreach*, 11) *Health and Well-being of Livestock*, 12) *Horticulture and the Reduction of Pests and Disease Outbreaks in Plants*, 13) *Natural and Environmental Economics, Markets and Policy*, and 14) *College of the Environment and Life Sciences (CELS) Community Access to Research and Extension Services (CARES)*.

As a result of changes in the strategic directions of RIAES/RICE and with the establishment of the National Institute of Food and Agriculture we have modified our Plan of Work Update 2011-2016. We adapted, modified and eliminated from the list of fourteen programs above and consolidated to five programs. The five programs are: 1) *Food Production and Sustainability* (incorporates previous programming from: Sustainable Communities, Aquaculture Biotechnology, Community Gardening and Outreach, Health and Well-being of Livestock, Horticulture and the Reduction of Pests and Disease Outbreaks in Plants, Natural and Environmental Resource Economics, Markets and Policy); 2) *Bioenergy, Climate and the Environment* (incorporates previous programming from: Water Quality and Forestry and Wildlife); 3) *Food Safety, Nutrition and Human Health* (incorporates previous programming from: Food Safety; Nutrition, Health and Obesity Prevention; Food Insecurity and Nutrition in Vulnerable Populations; and Vector Borne Diseases and Human Health); 4) *Youth and Community Development* (incorporates previous programming from: Children, 4-H and Families); and 5) *CELS CARES*.

The Station and Extension are integral components of the missions of the College and University. The collaborative relationship with our federal partner, CSREES, has enabled our scientists, staff and students to leverage additional resources that provide contemporary knowledge, essential services and innovative programming for all Rhode Islanders.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	28.6	0.0	28.6	0.0
Actual	25.1	0.0	26.0	0.0

II. Merit Review Process

1. The Merit Review Process that was Employed for this year

- Internal University Panel
- External University Panel
- External Non-University Panel

- Expert Peer Review

2. Brief Explanation

Program review, including project merit and peer review, are the responsibility of the Director, Associate Director and five Program Leaders.

Projects are awarded through a competitive, outcome-oriented annual request for proposals. Project proposals are peer reviewed by scientists external to URI, a panel of external experts (typically 4) and by the program leaders (internal). They are prioritized based on merit and anticipated outcome, as well as goodness of fit to the program areas, quality of science, integration with extension, and multistate collaboration. Projects normally run 3 years, and funding typically includes support for graduate students, a small operating budget, and travel. Station funds also support a limited number of support staff for research and outreach operations as well as partial support for other research associates and assistants.

Extension programs and projects are evaluated on a yearly basis by the Director. A significant limitation on our Extension programming evaluations is having many statutory employees in RICE. Statutory status in the Rhode Island state system does not allow for re-deployment of the employee. As statutory employees have retired from the State, we have not replaced the employee on Federal formula funds.

In this report, the programs all note that evaluation studies are completed. To that end, the merit process described herein is a primary mechanism for determining program effectiveness. Projects, funded within a program have a lifespan, on the average of 3 years. At the end of the three year period, an investigator must "reapply" for support. If the rationale is compelling and the accomplishments are consistent with the effort, a project is renewed. Hence, the outcomes of a project (either research, extension or integrated) are evaluated constituting a summative evaluation for each of the programs described herein.

III. Stakeholder Input

1. Actions taken to seek stakeholder input that encouraged their participation

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups
- Targeted invitation to non-traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to non-traditional stakeholder individuals
- Targeted invitation to selected individuals from general public
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals
- Survey of the general public
- Survey specifically with non-traditional groups
- Survey specifically with non-traditional individuals
- Survey of selected individuals from the general public

Brief explanation.

Each of the Program Leaders and their project managers (or principal investigators) employs a variety of methods and actions to seek stakeholder input. Each of the actions above are used (however, not by all Program Leaders and/or project managers). One of the great advantages of providing programming and seeking input in a small state like Rhode Island is the access that our program leaders, scientists, educators and staff have with stakeholder groups and individuals.

2(A). A brief statement of the process that was used by the recipient institution to identify individuals and groups stakeholders and to collect input from them

1. Method to identify individuals and groups

- Use Advisory Committees
- Use Internal Focus Groups
- Use External Focus Groups

- Open Listening Sessions
- Needs Assessments
- Use Surveys

Brief explanation.

Each of the Program Leaders and their project managers (or principal investigators) employs a variety of methods and actions to identify individual stakeholders and stakeholder groups. All the methods above are used however, not by all Program Leaders and/or project managers. Hence, we use paper, electronic, mass media, and face-to-face methods to identify stakeholders. One of the great advantages of providing programming and services in small state like Rhode Island is the access that individuals and groups have to the University of Rhode Island and the Land Grant Programs. The state is roughly 1,000 sq miles and there are no municipalities, counties, or areas that are more than 40 miles from the University. Equally important, the University and our Land Grant Programs have both a rural (Kingston, main campus) and urban (Providence) presence. These portal locations play a key psychological role for stakeholders. Rhode Islanders know that they have access to the University by virtue of proximity, both real and virtual.

2(B). A brief statement of the process that was used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them

1. Methods for collecting Stakeholder Input

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals
- Meeting with the general public (open meeting advertised to all)
- Survey of the general public
- Meeting specifically with non-traditional groups
- Survey specifically with non-traditional groups
- Meeting specifically with non-traditional individuals
- Survey specifically with non-traditional individuals
- Meeting with invited selected individuals from the general public
- Survey of selected individuals from the general public
- Other (Webinars)

Brief explanation.

Each of the Program Leaders and their project managers (or principal investigators) employs a variety of methods for stakeholder input. All the methods above are used however, not by all Program Leaders and/or project managers.

3. A statement of how the input will be considered

- In the Budget Process
- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- In the Staff Hiring Process
- In the Action Plans
- To Set Priorities

Brief explanation.

Input from stakeholders is carefully considered by the program managers, principal investigators, Program Leaders and Land Grant administrators. Indeed, the stakeholder input (which reflects stakeholder needs) has been used to frame our Land Grant budgeting, to identify emerging issues, to redirect outreach programs, to redirect research programs, and to guide priorities which ultimately set the action plans (including hiring plans.)

For example, stakeholder input from local fruit and vegetable producers has lead to our hiring a new Extension agent whose efforts are dedicated to the development of sustainable agricultural practices at the local level. (This program is described in the section of this report identified as "Sustainable Communities.")

Brief Explanation of what you learned from your Stakeholders

Stakeholders are readily willing to share items that they want from our institution. (Many stakeholders reflect that the University has changed dramatically in the past 20 years and services that were once available are no longer.) The key to successful relationship building with stakeholders is to not only identify areas of common interest but areas of common action. For instance, what are the researchable problems faced by the "industry"? Is the researchable problem fundable? Is the problem consistent with regional and/or national funding priorities? Likewise, the same holds true for Extension and outreach programming. What are the areas of common action?

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
1044646	0	1339891	0

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	1041328	0	1125573	0
Actual Matching	1044684	0	1364876	0
Actual All Other	0	0	0	0
Total Actual Expended	2086012	0	2490449	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from				
Carryover	0	0	0	0

V. Planned Program Table of Content

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Food Safety

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	50%		50%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	50%		50%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	1.8	0.0	0.0	0.0
Actual	2.1	0.0	0.5	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**
118902	0	28127	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
170549	0	45169	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

•Continue to implement HACCP training for RI school food service operations
•Provide HACCP and sanitation education programs to a variety of food processors
•Host an annual Food Safety Conference for public and private stakeholders
•Maintain a Good Agricultural Practices (GAP) Program for commercial growers of fruit and vegetables
•Maintain RI Food Safety Manager courses
•Develop internet-based training on Food Safety issues
•Develop Food Safety Curriculum materials for Special Needs students (ages 16-21)

2. Brief description of the target audience

Food industry and food service workers and managers, food processors, consumers, agricultural producers, home gardeners, school administrators, school-aged children and their caregivers, special needs students, teachers, community volunteers, Master Gardener volunteers.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	350	1000	0	1500
Actual	716	700	75	100

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

Patent Applications Submitted

Year: 2009
Plan: 0
Actual: 2

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	0	2	
Actual	0	2	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Peer Reviewed Publications

Year	Target	Actual
2009	2	2

Output #2

Output Measure

- Abstracts

Year	Target	Actual
2009	1	9

Output #3

Output Measure

- Professional Training Sessions (educators, farmers, food industry and food service personnel)

Year	Target	Actual
2009	15	25

Output #4

Output Measure

- Volunteer Training

Year	Target	Actual
2009	5	2

Output #5

Output Measure

- Conferences Hosted

Year	Target	Actual
2009	1	1

Output #6

Output Measure

- School Based Training Sessions (teachers and children)

Year	Target	Actual
2009	2	2

Output #7

Output Measure

- Website Development and Refinement

Year	Target	Actual
2009	1	1

Output #8

Output Measure

- Student training

Year	Target	Actual
2009	1	5

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Commercial growers of fruit and vegetables, food industry producers and school personnel will participate in appropriately directed food safety training (# of people trained)
2	Implement the internet based training for Good Manufacturing Practices(GMP)and personal hygiene for processors and warehouses. As a member of a regional team (# of training sessions)
3	Formulate new approaches to food safety education for consumers, schools and the food industry in Rhode Island
4	Develop, implement and evaluate new health and food safety training and resource materials for targeted audiences such as consumers, educators, food industry personnel and health care providers (# of new programs).
5	Commercial growers of fruit and vegetables, food industry producers PROCESSORS and school personnel FOODSERVICE will participate in appropriately directed food safety training (# of people trained).
6	Formulate new approaches for food safety education for consumers, school educators and the food industry in residential institutions in Rhode Island. (# people)

Outcome #1

1. Outcome Measures

Commercial growers of fruit and vegetables, food industry producers and school personnel will participate in appropriately directed food safety training (# of people trained)

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Implement the internet based training for Good Manufacturing Practices(GMP)and personal hygiene for processors and warehouses. As a member of a regional team (# of training sessions)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	2	271

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
GMPs are the foundation of food safety in the processing sector. A solid knowledge of GMPs will help enhance all food safety programs implemented by food processors.

What has been done
GMPs are the foundation of food safety in the processing sector. A solid knowledge of GMPs will help enhance all food safety programs implemented by food processors.

Results
Since launch, April 2008, through 2009, there have been 271 registrants.

4. Associated Knowledge Areas

KA Code	Knowledge Area
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #3

1. Outcome Measures

Formulate new approaches to food safety education for consumers, schools and the food industry in Rhode Island

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Develop, implement and evaluate new health and food safety training and resource materials for targeted audiences such as consumers, educators, food industry personnel and health care providers (# of new programs).

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The benefits/risks of eating seafood is an important issue to the public. Information is misunderstood and incorrect information that is being disseminated. Seafood is an important component of the diet with proven impacts on cardiovascular health and cognitive development. Many health and medical agencies have recommended that the

American public eat at least 2 servings of fish a week to get the omega-3 fatty acids (DHA and EPA) required for a healthy diet. Health care providers must provide correct information concerning the importance of eating seafood and how to keep seafood safe.

What has been done
A survey was completed that evaluated the knowledge and attitudes of health care providers regarding seafood consumption and benefits and risks of eating seafood. There were 647 respondents from all facets of the health care providers.

Results
The seafood knowledge was low in all areas tested and did not meet the 80% correct mastery level set by the researchers. The survey also queried about the training and information formats for this target group and their patients. Using this information, the multi-state research group will be designing and testing resource materials.

4. Associated Knowledge Areas

KA Code	Knowledge Area
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #5

1. Outcome Measures

Commercial growers of fruit and vegetables, food industry producers PROCESSORS and school personnel FOODSERVICE will participate in appropriately directed food safety training (# of people trained).

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	600

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Food safety issues related to food and food processing continue to be of concern. Mitigating strategies that emphasize prevention require continued attention. Training, a the key to behavior change, requires constant revision to include outreach education and updated information. Training that meets regulatory mandates, teaches food industry personnel how to comply and thus stay in business or enhance business by adopting a program required by a new buyer. This is a consumer, regulatory and processor issue to keep customers and the public safe from improperly handled food.

What has been done
The RI Good Agricultural Practices (RIGAP)program,a URI/RI DEM-Division of Agriculture program and the only state supported certification program in the country (versus USDA) has been enormously successful. Seafood and Meat and Poultry HACCP training is on-going with colleagues in Connecticut. Seventy processors successfully completed the classes. Manager certification and instructor training reached 95 participants. The annual Food Safety conference was offered jointly with Yankee Conference and 100 attendees at the Food Safety track.

Results
The RIGAP workshops trained 30 more individuals and increased the certified farms in RI to 31 thus allowing greater participation in the farm to school program in RI. The HACCP classes have trained 70 individuals and manager certification has trained 95. There were 100 attendees at the food safety conference.

4. Associated Knowledge Areas

KA Code	Knowledge Area
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #6

1. Outcome Measures

Formulate new approaches for food safety education for consumers, school educators and the food industry in residential institutions in Rhode Island. (# people)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	310

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Residential childcare institutions were targeted due to NFS/USDA requirements for institutions serving food and receiving school lunch subsidies. Small RCCIs, with few resources, were the focus. Food safety resources were developed that targeted special education teachers and students to help fulfill a life skills requirement (ADA) and promote food safety for an at risk audience. Resurgence of home food preservation require that food safety risks are addressed. Benefits of eating seafood are well known, but cooking and handling is a problem for consumers. There have been numerous outbreaks associated with food that is prepared and served at community events by volunteers.

What has been done
Food preservation workshops, Good Agricultural Practices (GAP)for home gardener workshop, Volunteer food service worker workshops, Senior citizen programs, new training for Residential Childcare Institutions (RCCI) personnel, teacher inservice for food safety targeting special needs students in high school and transition centers, and the continuation of annual community lecture series that incorporates presentations on seafood safety/cooking demonstration.

Results

40 participants attended a preservation workshop focusing on food preservation methods - risks/benefits. 126 consumers attended 2 community lectures that featured a well-known chef who demonstrated proper handling and cooking methods of seafood. 8 Master Gardener volunteers attended a training on integrating GAP food safety principles (normally targeted at commercial growers) with home gardening practices. A new program was developed and implemented targeting RCCI staff (80 in RI, 74 in MA) regarding food safety for the food preparation and service for residents. Over 20 teachers (CT, RI) were trained as part of the food safety for special needs high school and transition students. A pilot program was implemented (132 students) and the curriculum was evaluated and rated at 4.5 (out 5.0). Based on teacher evaluation the curriculum was revised and finalized.

4. Associated Knowledge Areas

KA Code	Knowledge Area
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (No funding)

Brief Explanation

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

1. Evaluation Studies Planned

- Retrospective (post program)
- Before-After (before and after program)
- During (during program)

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Nutrition, Health and Obesity Prevention

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
702	Requirements and Function of Nutrients and Other Food Components	25%		25%	
703	Nutrition Education and Behavior	75%		75%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	0.3	0.0	0.5	0.0
Actual	1.7	0.0	3.0	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**
70724	0	127458	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	154383	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

For KA 702:
•Data collection
•Fitness testing and body composition analysis
•Survey and questionnaire completion
•Blood analysis and dietary intake calculations
For KA 703:

•Facilitate partnership with Latino communities
•Develop curriculum and teacher training programs
•Conduct focus groups with Latinos

•Develop health and nutrition assessment tools that are appropriate for the Latino audience
•Develop and test interventional modalities for health maintenance and obesity prevention
•Conduct surveys
•Analyze data
•Print materials and develop curriculum
•Conduct workshops/interventions
•Evaluate outcomes

2. Brief description of the target audience

KA 702: Lean and obese adults
KA 703: Latino men and women; low-income school age children and families

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	400	0	500	0
Actual	150	0	0	0

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

Year: 2009
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	0	0	
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Develop and conduct healthy weight focus group research component

Year	Target	Actual
2009	0	0

Output #2

Output Measure

- Develop, conduct and evaluate a pilot healthy weight group study

Year	Target	Actual
2009	0	0

Output #3

Output Measure

- Refine, deliver and evaluate major healthy weight intervention study

Year	Target	Actual
2009	1	0

Output #4

Output Measure

- Conduct metabolic studies

Year	Target	Actual
2009	1	1

Output #5

Output Measure

- Peer reviewed publications

Year	Target	Actual
2009	2	0

Output #6

Output Measure

- Abstracts

Year	Target	Actual
2009	2	1

Output #7

Output Measure

- Workshops

Year	Target	Actual
2009	1	0

Output #8

Output Measure

- Student Training

Year	Target	Actual
2009	3	1

Output #9

Output Measure

- Professional Training

Year	Target	Actual
2009	1	0

Output #10

Output Measure

- Scientific and Professional Presentations

Year	Target	Actual
2009	2	0

Output #11

Output Measure

- MS Thesis or PhD Dissertation

Year	Target	Actual
2009	0	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Raise awareness and knowledge of healthy weight issues in the Latino population in Rhode Island (% change from baseline)
2	Increase maintenance of healthy weight among intervention participants (% achieving and maintaining healthy weight)
3	Increase understanding of lipoprotein metaolism and metabolic syndrome on human health in young adults.

Outcome #1

1. Outcome Measures

Raise awareness and knowledge of healthy weight issues in the Latino population in Rhode Island (% change from baseline)

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Increase maintenance of healthy weight among intervention participants (% achieving and maintaining healthy weight)

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Increase understanding of lipoprotein metaolism and metabolic syndrome on human health in young adults.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Young adults (18-24 years of age) have been identified by the NIH as a special population at risk. Once thought to be a healthy population, preliminary research has shown that they are at risk of developing coronary heart disease (CHD). Lifestyle choices that are leading to this increased CHD risk can begin in young adulthood and track through adulthood. Lifestyle choices of young adults, including diet and activity, need to be targeted to lessen the burden of disease. Groups such as the NIH, the USDA, and multiple other organizations such as the American Heart Association and the American Dietetic Association in addition to local, state, and federal officials are all interested in decreasing the burden of chronic disease such as CHD.

What has been done
The purpose of the study is to assess chronic disease risk in first-year University of Rhode Island students. During the fall 2008 and spring 2009 semesters, approximately 125 participants completed a heart disease risk factor screening study. Measures completed on all participants were anthropometrics, biochemical, clinical, and dietary assessments. Individual results were shared with study subjects in individual meetings in December 2008 and

May 2009. After the data was analyzed, the results were shared with the scientific community at Experimental Biology (April 2009). The results were also shared with two introductory URI Kinesiology classes.

Results
Approximately 4% of the study sample has the metabolic syndrome and it is more prevalent in females than males. The most common metabolic syndrome criteria in the sample were elevated triacylglycerols and low high density lipoprotein cholesterol. One graduate student and four undergraduate students were trained and mentored by the PI on all aspects of the scientific method and the research process.

4. Associated Knowledge Areas

KA Code	Knowledge Area
702	Requirements and Function of Nutrients and Other Food Components

V(H). Planned Program (External Factors)

External factors which affected outcomes
- Economy
- Competing Public priorities
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

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

1. Evaluation Studies Planned

- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Food Insecurity and Nutrition in Vulnerable Populations

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
703	Nutrition Education and Behavior	50%		50%	
704	Nutrition and Hunger in the Population	50%		50%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	4.5	0.0	2.0	0.0
Actual	4.5	0.0	2.0	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	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	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

•Assess the diet quality of targeted low-income, vulnerable populations.
•Assess the food security status of targeted low-income, vulnerable populations.
•Assess the food resource management and food safety practices of the target audience.
•Develop and implement assessment tools, curriculum, print materials and social marketing campaigns. •Evaluate the effectiveness of interventions and materials related to behavior change.
•Facilitate and strengthen community partnerships.
•Seek external funds to support program goals.

As a matter of explanation, we dedicate approximately 6 FTE's to this program. The funding for those FTE's is through Smith Lever, 3d funds not expressed in the financials associated with this report.

2. Brief description of the target audience

Low-income, Food Stamp eligible and participating families, children and older adults.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	4000	100000	5000	10000
Actual	9925	95000	4850	9400

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

Year: 2009
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	1	0	
Actual	1	0	1

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Peer reviewed publications

Year	Target	Actual
2009	1	0

Output #2

Output Measure

- Abstracts

Year	Target	Actual
2009	1	2

Output #3

Output Measure

- Scientific/Professional presentations

Year	Target	Actual
2009	1	1

Output #4

Output Measure

- Website Development and Refinement

Year	Target	Actual
2009	1	1

Output #5

Output Measure

- Public Service Announcements and Social Marketing Campaigns

Year	Target	Actual
2009	1	1

Output #6

Output Measure

- Video Productions

Year	Target	Actual
2009	1	0

Output #7

Output Measure

- Curriculum Development and Delivery

Year	Target	Actual
2009	1	3

Output #8

Output Measure

- Fact Sheets, Bulletins and Newsletters

Year	Target	Actual
2009	20	18

Output #9

Output Measure

- Student Training

Year	Target	Actual
2009	5	10

Output #10

Output Measure

- Volunteer Training

Year	Target	Actual
2009	15	7

Output #11

Output Measure

- Workshops and Programs

Year	Target	Actual
2009	120	458

Output #12

Output Measure

- MS Thesis or PhD Dissertation

Year	Target	Actual
2009	1	3

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	25% of EFNEP and FSNE Families and Older Adults will improve dietary practices from baseline in one or more domains (diet quality, food security, food resource management, or food safety) thus reducing future risk of disease and improving health and quality of life (# representing 25%).

Outcome #1

1. Outcome Measures

25% of EFNEP and FSNE Families and Older Adults will improve dietary practices from baseline in one or more domains (diet quality, food security, food resource management, or food safety) thus reducing future risk of disease and improving health and quality of life (# representing 25%).

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1000	1233

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
In order to help Rhode Island residents deal with unemployment topping 13% in fiscal '09, workshop sessions providing strategies for reducing costs, gaining access to free food programs and building or maintaining a healthy diet - resource management, shopping/budgeting, and low-cost food preparation- were a major focus.

What has been done
URI SNAP-Ed and EFNEP delivered 503 community-based nutrition education presentations relating to three behavioral outcomes: eat fruits and vegetables, whole grains and nonfat or low-fat milk products every day; be physically active every day as part of a healthy lifestyle; and balance calorie intake from foods and beverages with calories expended. Numerous recipes, fact sheets, posters, calendars and newsletters were distributed to thousands of Rhode Island residents through our 42 matching community partners.

Results
1. As a result of "Healthy Foods, Healthy Families Kid's Market" intervention at four Farmer's Markets throughout Rhode Island, 103 adult participants reported a 46.6% and 43.7% increase in their fruit and vegetable

consumption, respectively.
2. 71% of senior high school students in Classical High School, Providence RI reported eating at least one additional serving of dairy after learning the importance of dairy and health.
3. After a 5 week Physical Activity component to traditional EFNEP programming, time spent walking increased from an initial 49 minutes at program start to 109 minutes at week 5.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

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

1. Evaluation Studies Planned

- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Children, 4-H and Families

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
802	Human Development and Family Well-Being	50%		0%	
806	Youth Development	50%		0%	
	Total	100%		0%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	7.0	0.0	0.0	0.0
Actual	5.0	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**
250501	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
205416	0	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

•Forge academic connections to strengthen CFF curriculums, provide undergraduate experiential learning opportunities, increase program research base and utilizes evaluation expertise to measure impacts and improve programs

•Connect target audience to CFF educational programs though workshops, web-based training and newsletters, 4-H volunteer training and curriculum guides (train the trainer), community-based agency trainings (train the trainer)

•Develop resources and information to connect youth and families to community and land-grant resources (CFF to serve as the portal)

•Expansion of the 4-H club system into currently underrepresented, urbanized areas of the state and creation of a state-wide

network of 4-H science enrichment after school programs that serve as a catalystfor improve the science based knowledge, skills and academic motivation among urban elementary and middle school students

2. Brief description of the target audience

Youth 5-18 years of age
Parents of targeted youth
Community-based family-serving agencies and organizations
Volunteers

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	1000	3000	2500	4000
Actual	3212	4423	3399	700

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

Year: 2009
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	0	0	
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Workshops

Year	Target	Actual
2009	30	78

Output #2

Output Measure

- Volunteer Training (number of new volunteers per year)

Year	Target	Actual
2009	50	45

Output #3

Output Measure

- 4-H Record Book Submissions

Year	Target	Actual
2009	300	128

Output #4

Output Measure

- Youth reached through programs

Year	Target	Actual
2009	1000	1797

Output #5

Output Measure

- Number of community/family serving groups and organizations reached

Year	Target	Actual
2009	25	43

Output #6

Output Measure

- Number of referrals

Year	Target	Actual
2009	100	0

Output #7

Output Measure

- Community Service (# of projects per year)

Year	Target	Actual
2009	50	53

Output #8

Output Measure

- Activities and Programs (# per year)

Year	Target	Actual
2009	25	60

Output #9

Output Measure

- Student Training (# per year)

Year	Target	Actual
2009	20	38

Output #10

Output Measure

- Website development and refinement

Year	Target	Actual
2009	2	2

Output #11

Output Measure

- Curriculum development and delivery

Year	Target	Actual
2009	1	41

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Through project work and science and health enrichment programs, (%) 4-H club members and after school group members will demonstrate increased knowledge and skills that can be incorporated into their academic and personal lives.
2	% of enrolled 4-H youth who will demonstrate a commitment and understanding of their community and a sense of connectivity through increased delivery of community service programs to those in need.
3	Though training programs, club leadership activities and adult mentors, % of 4-H members who will develop leadership skills (e.g., public speaking, project leadership), gain confidence in their ability to lead and make a difference in their schools and communities and to incorporate these life skills into their daily lives.
4	% of parents, volunteers and adults serving youth and their families who will gain knowledge and skills that will foster positive youth development and family health and well-being.
5	% of parents who will learn and adopt more effective methods for parental discipline of children and better use of family time.
6	Through connecting to the vast land-grant system of resources and educational opportunities, % of parents and youth-serving adults who will gain knowledge and skills in risk reduction and adopt practices that promote health and safety within the family and community.
7	Pre-post measurement of educational activities, workshops to measure increases in knowledge and skills, focus groups and surveys to assess practice change and adoption, analysis of contact information and demographics to measure expansion of programs to currently underrepresented groups (urban, cultural-diverse communities, minorities, etc.) (Number of assessments per year)

Outcome #1

1. Outcome Measures

Through project work and science and health enrichment programs, (%) 4-H club members and after school group members will demonstrate increased knowledge and skills that can be incorporated into their academic and personal lives.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	35	230

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
According to the 2007 Kids Count report, "Research demonstrates a significant relationship between poverty and academic achievement in school." There is a great concern over the fact that minority children do not excel in math and science classes. URI/HDF CE program targets minority youth in urban area with the delivery of science enrichment programming. SET and healthy Lifestyles programming is also a major component of the RI OMK grant.

What has been done
The PSST afterschool science program is conducted once a week at three schools and one community site on Saturday. A three summer camp plus two field trips to URI Science labs is offered annually, an annual youth achievement night program is offered for parents. GPS, computer technology through MTL, rocketry, aquatics and animal science workshops are examples of how science education was delivered. 4-H also partners with the DEM Parks and Recreation to provide 4-H environmental programs at the RI Great Outdoors Pursuit over the summer.

Results
ANOVA test with a return rate of 45% yielded the following result: increase knowledge and skills and a positive increase in attitude towards science and learning.4-H Science Engineering and Technology and Healthy Lifestyles workshops were delivered at the Newport Navy Base, RI OMK programs and OMK Family Camps reaching 476 youth of RI military in the process of deployment. At the 4-H OMK-sponsored Hero's Day at the RWP Zoo, approximately 1300 youth participated in hands-on science and technology activities.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #2

1. Outcome Measures

% of enrolled 4-H youth who will demonstrate a commitment and understanding of their community and a sense of connectivity through increased delivery of community service programs to those in need.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	35	57

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Many youth lack opportunities to engage in positive out-of -school educational programs under the mentoring of caring adults who guide them in developing valuable life skills while aiding them in creating positive connections to the larger community and assisting them in successfully making the transition to productive, contributing young adults.

What has been done
RI 4-H Clubs and after-school groups are expected to plan and conduct at least one community service project during the 4-H YEAR. 4-H volunteers are provided with community service opportunities and connected to citizens and community groups in need. 4-H groups may apply for 4-H Foundation support for their projects. Two Cumberland Farms "Youth in Action" grants were targeted for service to the RI Operation: Military Kids Hero Pack program in FY09. 4-H members document their community service hours through their 4-H record books.

Results
59% of active 4-H clubs in RI reported carrying out an average of 2 or more community service projects in FY09 (average of 34 members per club) . 128 4-H members (12% of 4-H members enrolled in a 4-H club) documented a total 4694 community service hours in their record books (submitted to the state office for awards and county

medals). for FY09 341 4-H club members listed Community Service as a 4-H project for. Two 4-H Clubs received Cumberland Farms grants to support military families through the OMK "Hero Pack" project.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #3

1. Outcome Measures

Though training programs, club leadership activities and adult mentors, % of 4-H members who will develop leadership skills (e.g., public speaking, project leadership), gain confidence in their ability to lead and make a difference in their schools and communities and to incorporate these life skills into their daily lives.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	25	15

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Many youth are lacking in school and family-center opportunities and support to increase their communications and leadership skills. Youth need a safe and nurturing environment to test their abilities and receive constructive and supportive feedback. Encouragement by caring adults and positive peer support enable you to develop confidence and incorporate these life skills into their school and community.

What has been done
All 4-H club members are encouraged to participate in the RI 4-H Public Presentations programs at the club, district and state level. 4-H volunteers and staff provide training to youth and both competitive and non-competitive

speaking and demonstration opportunities are available. Besides District and State competitions, 4-Hers are encouraged to participate in opportunities to educate the public about 4-H and their 4-H projects at 4-H Goes to the Zoo (Roger Williams Park Zoo in Providence), Washington County Fair Farm School, Farmers Markets and other public events. 4-H teens accept leadership roles in their 4-H clubs and at district and state 4-H events and programs.

Results

100 4-H members (10% of RI enrolled 4-H members) participated in district public presentation contests with 95% receiving a score of 85% or higher (Danish Blue). 4-H teens demonstrated their leadership ability by assuming major roles at 4-H Fairs, animal science workshops and events and at the Eastern States Exposition. 4-H teens served at counselors at RI OMK Family Camp. 4-H volunteers have reported increased leadership skills and confidence among their 4-H club officers and teen leaders. In FY 09 165 4-H members (15% of club membership) participated in the4-H Leadership Project.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #4

1. Outcome Measures

% of parents, volunteers and adults serving youth and their families who will gain knowledge and skills that will foster positive youth development and family health and well-being.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	35	601

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The number of children and families in Rhode Island living in poverty continues to increase. Family structures are stressed by poverty and decreasing community connection creating a weakened environment for child rearing. There is limited access to parent education programs for families and links between service providers and families has either been eliminated as a result of budget cuts or market decreases.

What has been done
RI Agency personnel and directors who work directly with families were surveyed to identify programming needs for parents and families in their respective geographic areas. Cooperative Extension Specialist from the /URI Department of Human Development and Family Studies developed/adapted, implemented and evaluated 15 workshops for the 2009 programmatic year. Evaluations were conducted at workshops to assess quality as well as outcomes.

Results
Direct programs reached 601 families. Evaluations collected at the conclusion of each 2 hour workshop yielded the following results: 92% of workshops rated the workshop as great or perfect; 96% rated the presenter as great or perfect; 90% indicated the information was practical; 86% reported learning 3 new concepts; 93% rated delivery methods as excellent. Outcome evaluation yielded the following: Compared to parents who have not attended Cooperative Extension Parent/Family workshops, parents who attended parenting workshops engage in significantly more nurturing parenting and less harsh parenting. Pre and post knowledge test scores yielded the following results: participants significantly improved their cognitive knowledge by 5 % regarding parenting and discipline as shown by an increase in pre and post knowledge test scores from 82% to 87%.

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being

Outcome #5

1. Outcome Measures

% of parents who will learn and adopt more effective methods for parental discipline of children and better use of family time.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	25	335

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The number of children and families living in poverty in Rhode Island has increased. Family structures are stressed by poverty and decreasing community connection creating a weakened environment for child rearing. There is limited access to parent education programs for families and links between service providers and a families has either been eliminated as a result of budget cuts or market decreases.

What has been done
RI Agency personnel and directors who work directly with families were surveyed to identify programming needs for parents and families in their respective geographic areas. Cooperative Extension Specialist from the /URI Department of Human Development and Family Studies developed/adapted, implemented and evaluated 15 workshops for the 2009 programmatic year. Evaluations were conducted at workshops to assess quality as well as outcomes.

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4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being

Outcome #6

1. Outcome Measures

Through connecting to the vast land-grant system of resources and educational opportunities, % of parents and youth-serving adults who will gain knowledge and skills in risk reduction and adopt practices that promote health and safety within the family and community.

Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

Pre-post measurement of educational activities, workshops to measure increases in knowledge and skills, focus groups and surveys to assess practice change and adoption, analysis of contact information and demographics to measure expansion of programs to currently underrepresented groups (urban, cultural-diverse communities, minorities, etc.) (Number of assessments per year)

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	2	10

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The number of children and families living in poverty in Rhode Island continues to increase. Family structures are stressed by poverty and decreasing community connection creating a weakened environment for child rearing. There is limited access to parent education programs for families and links between service providers and a families has either been eliminated as a result of budget cuts or market decreases.

What has been done
RI Agency personnel and directors who work directly with families were surveyed to identify programming needs for parents and families in their respective geographic areas. Cooperative Extension Specialist from the /URI Department of Human Development and Family Studies developed/adapted, implemented and evaluated 15 workshops for the 2009 programmatic year. Evaluations were conducted at workshops to assess quality as well as outcomes.

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4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
806	Youth Development

V(H). Planned Program (External Factors)

External factors which affected outcomes
- Economy
- Appropriations changes
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

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

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during 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

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Sustainable Communities

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
601	Economics of Agricultural Production and Farm Management	25%		25%	
602	Business Management, Finance, and Taxation	25%		25%	
605	Natural Resource and Environmental Economics	25%		25%	
608	Community Resource Planning and Development	25%		25%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	1.0	0.0	0.0	0.0
Actual	0.6	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**
18367	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
75973	0	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

•Study and promote commercial farm viability
•Promote responsible stewardship of agricultural lands
•Work with municipalities and community members to manage natural and economic resources wisely
•Teach and promote sustainable development techniques and management to communities
•Promote, enhance and expand sustainable tourism in the state of Rhode Island

2. Brief description of the target audience

Farmers/ Farm Organizations

RI Department of Environmental Management (RI DEM), Division of Agriculture

RI Center for Agricultural Promotion & Education

Other Agricultural Service Providers

Tourism Councils and Tourism Businesses

Land Trusts

Policy Makers and Municipal Leaders

Grassroots and Community Organizations

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	500	10000	0	500
Actual	500	20000	230	500

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

Year: 2009
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	0	0	
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Identify new muncipal partners

Year	Target	Actual
2009	1	5

Output #2

Output Measure

- Conduct Community based workshops

Year	Target	Actual
2009	5	5

Output #3

Output Measure

- Professional training

Year	Target	Actual
2009	8	8

Output #4

Output Measure

- Public presentations

Year	Target	Actual
2009	5	5

Output #5

Output Measure

- Website development and refinement

Year	Target	Actual
2009	1	1

Output #6

Output Measure

- Student Training

Year	Target	Actual
2009	2	230

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Provide information and training to municipal leaders and organizations on management of natural resources and community assets.
2	Provide information and training to farmers and rural landowners on estate planning strategies and economic development opportunities.
3	Improve viability of agriculture in the state of Rhode Island through farmer education/information and consulting concerning sustainable agricultural practices, value added products and agri-tourism.
4	Consult with grassroots and municipal bodies to identify planning processes and strategies that preserve viable farmland, promote sustainability and economic development

Outcome #1

1. Outcome Measures

Provide information and training to municipal leaders and organizations on management of natural resources and community assets.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	5	15

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Rhode Island's agricultural land is one of the state's most important natural resource and community assets. Unfortunately, too many residents have little to no understanding of its value. This year alone, two Rhode Island communities have been actively engaged in trying to limit or eradicate farming from within their town limits. If we are to have healthy communities--physically, emotionally, economically--we need to educate our municipal leaders on the necessity for maintaining natural resources and community assets such as our farms.

What has been done
This has been a critical year for this outcome in Rhode Island. Nearly 2 dozen individuals (including the state agricultural extension agent as one of the administrative team) representing every aspect of Rhode Island Agriculture--civic organizations, government entities, farmers, and agricultural service providers--received a private grant to form the Rhode Island Agricultural Partnership. One of the goals of this group is to develop a state-wide 5-year strategic plan for agriculture that will be incorporated into the state guide plan. This will be a first for the nation, to our knowledge: a plan for agriculture that encompasses all of the stakeholders and issues related to a vibrant agricultural sector. The state agricultural extension agent has also met with the Executive Director of the RI Farm Bureau and state legislators to prioritize agricultural legislation for the upcoming session and serves as an adviser to the State Technical Team and the State Conservation Committee. The Agricultural Extension Agent also had the opportunity to lead a discussion of wildlife habitat (specifically for ground-nesting birds) for a community presentation co-sponsored by the Northern RI Conservation Districts, Providence Water, and the Natural Resources Conservation Service.

Results
The Rhode Island Agricultural Partnership has hired American Farmland Trust to assist in developing the state's 5-year strategic plan for agriculture. Three listening sessions have been scheduled to elicit stakeholder input as to the most pressing agricultural needs in the state and potential solutions. The State Planner, town planners, and other municipal leaders are also engaged in this process. Future plans include a system for advising communities on the development of their comprehensive plans in a way that is friendly to all of their varied natural resources. The wildlife habitat presentation resulted in a new awareness in many participants that even wildlife habitat (for specific uses) must be managed or else it will morph into something inhospitable to the target species.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
605	Natural Resource and Environmental Economics
608	Community Resource Planning and Development

Outcome #2

1. Outcome Measures

Provide information and training to farmers and rural landowners on estate planning strategies and economic development opportunities.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1	15

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Rhode Island has some of the most valuable farmland in the country as well as some of the highest estate taxes. Farmers (or the children of farmers) who have not engaged in thoughtful estate planning often find themselves facing unmanageable taxation and the loss of their family farms. Unfortunately, these farms are often sold to the highest bidders: developers. By providing farmers with sensible, farm-centered estate planning services and

information on alternative economic development opportunities, we will be able to help keep farmers farming.

What has been done
This year, the state agricultural extension agent has established a solid working relationship with an organization in Massachusetts that offers estate planning/land transfer services. She has sent half a dozen farmers to that organization to receive assistance in issues specifically related to land transfer. The RI state extension agent is also partnering with several other organizations in and around Rhode Island to write grant proposals on the issue and develop self-sustaining land transfer programs in southern New England. Estate planning was also an element addressed in the Exploring the Small Farm Dream course co-sponsored by URI Cooperative Extension.

Results
Solid results in this area can take 5-10 years to see, so we are still at the beginning. However, thirteen beginning farmers at the Exploring the Small Farm Dream heard that land transfer needs to be considered at the beginning of an agricultural venture as a form of "exit strategy." At least two other individuals were referred to estate planning specialists by the agricultural extension agent.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
605	Natural Resource and Environmental Economics

Outcome #3

1. Outcome Measures

Improve viability of agriculture in the state of Rhode Island through farmer education/information and consulting concerning sustainable agricultural practices, value added products and agri-tourism.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1	20000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Agriculture is at the heart of a strong community. The renewed interest in local foods and sustainable agricultural practices has led to an increase in the numbers of new farmers entering the field, so to speak. These new farmers often have little to no background in agriculture, and therefore need bottom-up training. For existing farmers, new methods of pest control and land management are constantly evolving, and the rate of adoption is directly tied to the education and hands-on consulting services available. Our farms are also increasingly resembling the farms our great-grandparents had: small, multi-use tracts where production, processing, and entertainment all occur in the same location. Our farmers need assistance in maneuvering the regulations and practices associated with farming in the 21st century.

What has been done
URI Cooperative Extension had some exciting opportunities for education. The most unexpected was a request to join a panel on a local television program: Good News RI! The state extension agent joined two farmers and shared information about RI agriculture and the ways in which the community can support them. The program aired three times over the course of a week. The extension agent also organized and moderated two sessions for Beginning Farmers as part of her role as a Steering Committee Member for the New England Vegetable and Fruit Grower Conference. (This year's conference attendance achieved a record of 1,557 people.) To further equip beginning farmers, URI Cooperative Extension also organized and hosted Rhode Island's first Exploring the Small Farm Dream Course. Additional extension activities included answering production, processing, and marketing questions via telephone and email, attending annual meetings for producer organizations, and performing farm visits.

Results
URI Cooperative Extension received positive feedback from many producers and community members who saw the airing of Good News RI! Due to the nature of television, it is difficult to quantify the total effect of the program,

but the agricultural community feels that public awareness of agriculture's benefits to the state is critical. The record attendance at the New England Vegetable and Fruit Growers Conference attests to the fact that this biennial conference is a key opportunity for educating New England producers. While the numbers attending Rhode Island's Exploring the Small Farm Dream Course (13) were smaller than those at the New England Conference (1,557), the relative impact may be equally significant. This was the first time Rhode Island had offered this course. Participants felt that they had a better understanding of the challenges and opportunities facing RI farmers and a clearer sense of what their next steps should be. URI Cooperative Extension viewed this course as a pilot program to determine whether it should become an annual offering; all involved agree that it should be. (The "graduates" asked if they could come back for a reunion and meet next year's "class"!) Having educated and enthusiastic individuals like these entering farming will ensure the long-term viability of Rhode Island's Agricultural sector.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
605	Natural Resource and Environmental Economics
608	Community Resource Planning and Development

Outcome #4

1. Outcome Measures

Consult with grassroots and municipal bodies to identify planning processes and strategies that preserve viable farmland, promote sustainability and economic development

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
605	Natural Resource and Environmental Economics
608	Community Resource Planning and Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

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

1. Evaluation Studies Planned

- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Vector Borne Diseases and Human Health

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
721	Insects and Other Pests Affecting Humans	20%		20%	
722	Zoonotic Diseases and Parasites Affecting Humans	80%		80%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	1.0	0.0	2.0	0.0
Actual	1.5	0.0	0.1	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**
51102	0	1742	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
24551	0	29761	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

Twelve field sampling sites were selected following a hierarchical sampling design, all located within 1km^2 MODIS (Moderate Resolution Imaging Spectroradiometer) pixel coordinates in three state management areas stratified by latitude in Rhode Island (Arcadia and Burlingame Management Areas, and Scituate Reservoir). Modified and standardized sampling procedures for remotely sensed data application analysis. A network of 12 relative humidity (RH) data measurement and logger instruments were established in corresponding field sampling sites. Collected weekly nymphal tick abundance samples and hourly RH logger readings (weather permitting) for each site from mid-June to late August. Used linear regression to assess the relationship between logger-RH and nymphal tick abundance after adjusting for seasonal tick phenology. Trained students in standard sampling protocols, RH logger data retrieval and GPS technology. Attended URISA 2009 GIS in Public Health Conference and associated training work-shops. Mentored Coastal Fellow intern research project based on collected field data. Results of current analysis will be used to 1) determine if temporal measurements of atmospheric moisture correlated with observed levels of tick

activity/survival; 2) evaluate if relatively fine-scale measures of atmospheric moisture will be required to provide near-real time estimates of RH in tick habitat and predictions of tick activity; and 3) assess if a multi-sensor approach can be used to relate remotely sensed MODIS satellite data to atmospheric moisture conditions affecting tick survival. Expected output products of this research will be models for: 1) estimating hourly RH in nymphal blacklegged tick habitat using readily available NOAA weather station data and other site characteristics; and 2) relating nymphal blacklegged tick activity with these atmospheric moisture levels.

2. Brief description of the target audience

A key outreach goal of the URI's TickEncounter Resource Center (TERC) is to develop products and programming that help people to "Think TICK (and) take ACTION" to prevent tick bites and disease. Using remote sensing and field measurements, this project will attempt to develop a tick risk forecast that can be updated weekly during the summer tick encounter season. As this team of entomologists and environmental scientists develop these models, the Cooperative Extension team will begin developing a process and interface for capturing climate data and generating automated animations that deliver regular (weekly) tick encounter risk updates on both a state and regional scale. These outputs will be in the form of easily-interpreted, continuous surface risk maps. By integrating biogeophysical process affecting tick activity and mortality with multi-media health information delivery systems, expected outcomes from this work will be improved decision support and an increase in the number of people taking risk-appropriate actions to prevent tick-bites and disease.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	100	10000	100	5000
Actual	1176	48000	532	5000

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

Year: 2009
Plan: 0
Actual: 1

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	0	0	
Actual	0	5	5

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Peer reviewed publications

Year	Target	Actual
2009	3	5

Output #2

Output Measure

- Books and monographs

Year	Target	Actual
2009	1	0

Output #3

Output Measure

- Abstracts

Year	Target	Actual
2009	4	8

Output #4

Output Measure

- Conference proceedings

Year	Target	Actual
2009	1	1

Output #5

Output Measure

- Workshops

Year	Target	Actual
2009	10	2

Output #6

Output Measure

- Website development and refinement

Year	Target	Actual
2009	1	1

Output #7

Output Measure

- Public presentations

Year	Target	Actual
2009	3	32

Output #8

Output Measure

- Public service announcements

Year	Target	Actual
2009	2	1

Output #9

Output Measure

- Student training

Year	Target	Actual
2009	2	8

Output #10

Output Measure

- M.S. theses and Ph.D. dissertations

Year	Target	Actual
2009	1	0

Output #11

Output Measure

- Postdoctoral fellow training

Year	Target	Actual
2009	1	2

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Identify areas of high risk for vector borne diseases in Rhode Island
2	Create tick surveillance database
3	Create web-based decision suupport system to reduce risk to vector borne diseases.
4	Reduce tick abundance community-wide
5	Characterize the salivary glands of ticks to identify compounds of potential pharmacological value
6	Formulate novel vaccination strategies to prevent tick-transmitted diseases
7	Elucidate transmission dynamics of pathogens among tick vectors
8	Increase research funding
9	Develop climate-based tick encounter risk prediction model

Outcome #1

1. Outcome Measures

Identify areas of high risk for vector borne diseases in Rhode Island

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Ongoing, systematic vector surveillance is critical for tracking disease risk trends, developing research hypotheses, and alerting public health and citizens at risk. Rhode Island has a unique, statewide, tick encounter risk surveillance program that samples nymphal blacklegged ticks at 61 sites from May to August.

What has been done
Completed 16th consecutive year of the Rhode Island statewide TickEncounter Risk survey. A continuous surface, nymphal blacklegged tick risk map was developed and distributed to media outlets in Rhode Island as well as publishing it on our tickencounter.org website.

Results
Nymphal blacklegged tick abundance in Rhode Island in 2009 was 64 percent higher when compared to the same period in 2008. Tick infection rates for Lyme disease spirochetes and the agent of human anaplasmosis were similar to rates determined in 2008 while the tick infection rate for the agent of human babesiosis decreased in 2009 from 17.3 percent in 2008 to 10.7 percent in 2009. Compared to the average of the past 15 years, nymphal tick populations were higher, especially in the northern part of Rhode Island where risk has historically been much

lower.

4. Associated Knowledge Areas

KA Code	Knowledge Area
721	Insects and Other Pests Affecting Humans
722	Zoonotic Diseases and Parasites Affecting Humans

Outcome #2

1. Outcome Measures

Create tick surveillance database

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Scientists need access to continuously collected ecological data to monitor trends and for testing hypotheses related to ecological questions.

What has been done
We continue to add to the extensive tick risk database which is the largest and longest continuously sampled blacklegged tick database in the world.

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
721	Insects and Other Pests Affecting Humans
722	Zoonotic Diseases and Parasites Affecting Humans

Outcome #3

1. Outcome Measures

Create web-based decision suupport system to reduce risk to vector borne diseases.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Most of the 169 million individuals in the USA with Internet access use it for health-related purposes at least once a month, and over half report that use of the Internet had improved the way they take care of themselves. The Internet appears to provide an excellent, low-cost means for disseminating information for health behavior change. Studies indicate that health related information gathered on the Internet does directly affect consumer decisions about seeking care as well as the nature of the treatments chosen. With the high incidence of Lyme disease and other tick-borne diseases in Rhode Island and the northeastern USA, broad dissemination of effective tick-bite protection decision support would be expected to improve tick control practices and reduce disease incidence.

What has been done
Created a high quality, interactive, Internet-based health promotion tool (www.tickencounter.org) to help people prevent tick bites and thereby lower the incidence of tick-borne diseases in Rhode Island and the northeast USA region. We continue to develop new content, products and tools for promoting tick bite protection and tick-borne disease prevention.

Results
We developed a TickEncounter Risk Calculator, a novel decision support tool that uses published and unpublished information related to risk for human encounter with the blacklegged tick vector of Lyme disease. It is a weighted empirical model for backyard settings that integrates geographically-based risk data, habitat characterization, human activity patterns, and current tick-bite prevention activities to calculate a personalized risk score (0-100) and to provide a tick-bite prevention action plan customized for each user.

4. Associated Knowledge Areas

KA Code	Knowledge Area
721	Insects and Other Pests Affecting Humans
722	Zoonotic Diseases and Parasites Affecting Humans

Outcome #4

1. Outcome Measures

Reduce tick abundance community-wide

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Human and animal diseases transmitted by black-legged ticks are increasing in Rhode Island and the larger northeastern United States region--the health burden from Lyme disease is estimated to cost Rhode Island more than $30 million annual, and in just the past five years, cases of the sometimes fatal human babesiosis and human anaplasmosis have increased in Rhode Island by >1,500% and >2,500%, respectively.

What has been done

Our group published one paper and participated in 3 additional papers reporting on the findings of the Northeast Tick Control Project. (Miller, N.J., W.A. Thomas, and T.N. Mather. 2009. Evaluating a deer-targeted acaracide applicator for area-wide suppression of blacklegged ticks, Ixodes scapularis (Acari:Ixodidae), in Rhode Island. Vector-Borne and Zoonotic Diseases. 9:401-406.)

Results

Over a seven-year period, as many as twenty-five USDA/ARS '4-Poster' acaricide applicators were distributed in areas of high deer activity throughout a 518-hectare area in a rural Rhode Island community. Corn consumption and acaricide levels for each device were monitored weekly during each treatment season to assess the degree of deer use. The efficacy of acaricide treatment was determined by comparing relative blacklegged tick (Ixodes scapularis) densities in the '4-Poster' treatment site to a separate, similar sized non-treatment area. The tendency of white-tailed deer to use the '4-Poster' was variable temporally, and appeared to be largely dependent on the availability of alternative food sources. Total corn consumption was nearly 4-fold lower during large oak masting years when compared with no/low mast years. Moreover, habitat characteristics, such as the presence of maintained hay lands consisting of alfalfa and clover, also appeared to influence the frequency and amount of '4-Poster' use. Following two years with adequate treatment (nearly 12,000 kg of corn consumed), we achieved nearly 50% control of nymphal blacklegged ticks within the treatment site when compared to tick abundance levels in the non-treated area. Moreover, that level of tick control was maintained for one year following removal of the '4-Poster' devices but began to wane two years after treatment ended.

4. Associated Knowledge Areas

KA Code	Knowledge Area
721	Insects and Other Pests Affecting Humans
722	Zoonotic Diseases and Parasites Affecting Humans

Outcome #5

1. Outcome Measures

Characterize the salivary glands of ticks to identify compounds of potential pharmacological value

Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

Formulate novel vaccination strategies to prevent tick-transmitted diseases

Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

Elucidate transmission dynamics of pathogens among tick vectors

Not Reporting on this Outcome Measure

Outcome #8

1. Outcome Measures

Increase research funding

Not Reporting on this Outcome Measure

Outcome #9

1. Outcome Measures

Develop climate-based tick encounter risk prediction model

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Human and animal diseases transmitted by black-legged ticks are increasing in Rhode Island and the larger northeastern United States region--the health burden from Lyme disease is estimated to cost Rhode Island more than $30 million annual, and in just the past five years, cases of the sometimes fatal human babesiosis and human anaplasmosis have increased in Rhode Island by >1,500% and >2,500%, respectively.

What has been done

Field experiments are being conducted to confirm previous lab-derived atmospheric moisture thresholds associated with blacklegged tick mortality. Additional GIS and remote sensing studies are providing critical data for fine-tuning the site-specificity of the relative humidity predictive model, and for extending the predictive capacity of a TickEncounter Risk Index to the larger Northeast Region. To validate the relationship between tick activity/survival and duration of exposure to sub-optimal RH, we conducted weekly tick sampling at field sites where humidity data is being collected. An important component of this work is to establish the relationship between relative humidity in tick habitat and a remotely sensed index of humidity. We are employing a hierarchical sampling design to scale-up from in situ field measurements of RH to remote sensing observations. We are taking advantage of spatial, spectral, and temporal resolutions from multi-sensor remote sensing data and are using regression models to assess which humidity variable (daily average, weekly average, number of consecutive 4 or 6 hr periods below the 82% threshold, etc.) best predicts tick activity levels.

Results

One year of field collections have been completed and a second year is planned for 2010.

4. Associated Knowledge Areas

KA Code	Knowledge Area
721	Insects and Other Pests Affecting Humans
722	Zoonotic Diseases and Parasites Affecting Humans

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Appropriations changes
- Populations changes (immigration, new cultural groupings, etc.)
- Other (Human behavior)

Brief Explanation

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)
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Aquaculture Biotechnology

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
302	Nutrient Utilization in Animals	25%		25%	
304	Animal Genome	25%		25%	
307	Animal Management Systems	15%		15%	
311	Animal Diseases	35%		35%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	0.8	0.0	2.0	0.0
Actual	0.8	0.0	2.5	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**
53990	0	69701	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	65151	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

Activities conducted during this period focused on two areas: diseases of shellfish and regulation of muscle growth of trout. In the area of shelfish diseases the role of matrix metalloproteinases (MMPs) on innate immune defenses and host-pathogen interactions in the oyster, a commercially important aquaculture species, was investigated. Hemocyte migration experiments were conducted and indicate that the presence of specific antigens stimulates a rapid release of oyster MMP in a dose dependent fashion as soon as 30 min after stimulation, followed by an upregulation of MMP production and activity and migration of cells through a membrane. These in vitro results, combined with the results from in vivo experiments showing the migration of Cv1MMP positive hemocytes through the epithelium of the mantle and digestive tissues of oysters challenged with the bacterial pathogen Roseovarius crassostreae and the protozoan parasite Perkinsus marinus indicate a potential role for Cv1MMP in

hemocyte migration in oysters in response to infection. Characterizing the role of MMPs in host-pathogen interactions in a model bivalve will help determine the basic role of MMPs in innate immunity and provide clues on diagnosis,prognosis and the development of treatments and disease-resistant strains.

To examine the function of myostatin on muscle growth in fish, transgenic rainbow trout carrying a construct with a muscle specific promoter and the coding region of the trout follistatin gene were generated by microinjection. Over 100 transgenic P1 progeny were produced and reared under standard husbandry conditions communally in the same rearing units as non-transgenic cohorts. The transgenic trout exhibited increased musculature similar to the "double-muscling" phenomenon observed in double muscled cattle (e.g., Belgian blue), bully whippets and mice null for myostatin. Muscle tissue was lethally sampled from a subgroup of transgenic and control fish to determine the effects of overexpression of follistatin. The levels of follistatin mRNA were assayed by RT-qPCR and found to be 20-40 fold greater than in non-transgenic control animals. Overall muscle mass in cross section was significantly higher in fish ovexpressing follistatin as was the number of muscle fibers per unit area. Combined the data revealed that the follistatin fish had significantly greater numbers of muscle fibers and that the increase in muscle was primarily due to hyperplasia, rather than hypertrophy. This research sheds light on the mechanisms controlling muscle growth in a commercially important species and paves the way for future research efforts to apply these results to commercial aquaculture.

2. Brief description of the target audience

The target audience for these research efforts include: shellfish and finfish aquaculturists, seafood distributors and processors, researchers in shellfish diseases, scientists investigating mechanisms regulating growth of fish, regulators (e.g., RI Department of Environmental Management, NMFS) and consumers.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	200	1000	75	0
Actual	200	900	70	0

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

Year: 2009
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	0	0	
Actual	0	1	1

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Peer Reviewed Publications

Year	Target	Actual
2009	3	1

Output #2

Output Measure

- Books and Monographs

Year	Target	Actual
2009	1	0

Output #3

Output Measure

- Abstracts

Year	Target	Actual
2009	2	3

Output #4

Output Measure

- Scientific and Professional Presentations

Year	Target	Actual
2009	2	3

Output #5

Output Measure

- Workshops

Year	Target	Actual
2009	2	2

Output #6

Output Measure

- Website development and refinement
  Not reporting on this Output for this Annual Report

Output #7

Output Measure

- Student training

Year	Target	Actual
2009	2	4

Output #8

Output Measure

- MS theses and PhD dissertations

Year	Target	Actual
2009	1	0

Output #9

Output Measure

- Postdoctoral fellow training

Year	Target	Actual
2009	1	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increased aquaculture production in Rhode Island (both of current species and new species)
2	Increased economic profitability for aquaculture farmers and terrestrial farmers who integrate aquaculture production with their traditional crops
3	Improved sustainable farming practices employed by the aquaculture industry and integrated terrestrial farmers

Outcome #1

1. Outcome Measures

Increased aquaculture production in Rhode Island (both of current species and new species)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Disease is a major problem facing oyster farmers in Rhode Island. Improving disease resistance in oysters has the potential to increase survival of stock. For culture of finfish, profitability is directly related to growth rate and feed conversion efficiency. Improvement of either would make finfish aquaculture in Rhode Island more economically viable.

What has been done
Research has been conducted to investigate specific aspects of the immune system in oysters. In finfish, investigations have been conducted on factors controlling muscle mass and growth.

Results
Investigation of matrix metalloproteinases in oysters suggests that these molecules are involved in the immune response of oysters to specific antigens. This information might aid in the selection of disease resistant stocks. Investigation of the role of follistatin in rainbow trout revealed that over expression of follistatin increases muscle fiber number and muscle mass. This technology and the pathways involved could lead to enhanced production of not only trout but other species of cultured fish.

4. Associated Knowledge Areas

KA Code	Knowledge Area
302	Nutrient Utilization in Animals
304	Animal Genome
307	Animal Management Systems
311	Animal Diseases

Outcome #2

1. **Outcome Measures**

Increased economic profitability for aquaculture farmers and terrestrial farmers who integrate aquaculture production with their traditional crops

Not Reporting on this Outcome Measure

Outcome #3

1. **Outcome Measures**

Improved sustainable farming practices employed by the aquaculture industry and integrated terrestrial farmers

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy

Brief Explanation

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

1. Evaluation Studies Planned

- Retrospective (post program)
- During (during program)
- Time series (multiple points before and after program)
- 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

V(A). Planned Program (Summary)

Program # 8

1. Name of the Planned Program

Water Quality

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	10%		10%	
112	Watershed Protection and Management	50%		50%	
131	Alternative Uses of Land	15%		15%	
133	Pollution Prevention and Mitigation	25%		25%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	7.0	0.0
Actual	3.2	0.0	3.1	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**
224950	0	68510	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
75853	0	141269	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

•Studies will be conducted to investigate the sources, fate and transport of nonpoint source contaminants in surface and ground water systems.
•The efficacy of different management practices will be evaluated at the local and watershed scale.
•New approaches to relate soil and landscape features to water quality stressors will be researched.
•Outreach efforts to community decision makers, agricultural, residential and engineering/regulatory community will be conducted.
•Demonstration sites will be established for use in such research and Extension programs.
•Publications, fact sheets, web sites will be developed, produced and disseminated.

2. Brief description of the target audience

Public decision makers / Policy makers (local, state and federal agencies); Research scientists; Extension Professionals; Municipal planners; Private sector firms engaged in watershed management, landscaping, onsite waste water treatment and private wells; A variety of NGOs (land trusts, environmental organizations, etc); Agricultural producers; the general public

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	500	5000	0	0
Actual	3745	16003	502	0

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

Patent Applications Submitted

Year: 2009
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	0	0	
Actual	0	3	3

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Peer Reviewed Publications

Year	Target	Actual
2009	4	3

Output #2

Output Measure

- Fact sheets, bulletins and newsletters

Year	Target	Actual

2009	10	29

Output #3

Output Measure

- Website development and refinement

Year	Target	Actual
2009	1	5

Output #4

Output Measure

- Training manuals and Instructional CDS developed

Year	Target	Actual
2009	2	0

Output #5

Output Measure

- Public service announcements, news releases/articles

Year	Target	Actual
2009	10	36

Output #6

Output Measure

- Books and monographs

Year	Target	Actual
2009	1	1

Output #7

Output Measure

- Abstracts

Year	Target	Actual
2009	5	9

Output #8

Output Measure

- Workshops and Conferences hosted or Co-hosted

Year	Target	Actual
2009	4	34

Output #9

Output Measure

- Presentations and Short Courses

Year	Target	Actual
2009	65	47

Output #10

Output Measure

- Student training

Year	Target	Actual
2009	2	47

Output #11

Output Measure

- MS theses and PhD dissertations

Year	Target	Actual
2009	1	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increased (%) of BMP approaches adopted by target audience
2	Development of new models
3	Increased (%) adoption of onsite wastewater management plans by local communities
4	Increased use and development (%) of locally based water quality and watershed data by community decision makers
5	Increased adoption (%) of improved landscape management practices by targeted populations
6	Increased testing of well water by targeted homeowner populations
7	Increased (%) proportion of professionals and the public knowledgeable in research-based approaches to design, install, maintain and improve onsite wastewater treatment and protect water quality, public health and the environment.
8	Increase in targeted households and professionals gaining research-based knowledge of testing, treatment and protection of private well water.
9	Increased understanding by scientists and decision makers through publications and presentations of the management and risks of watershed nitrogen delivery.
10	Increased (%) development of research-based, place-based water resource data for use by communities and the public.
11	Increased in the proportion of the public and professionals knowledgeable about management of storm water and using consistent educational materials to inform residents about stormwater problems and actions they can take to reduce polluted runoff.

Outcome #1

1. **Outcome Measures**

Increased (%) of BMP approaches adopted by target audience

Not Reporting on this Outcome Measure

Outcome #2

1. **Outcome Measures**

Development of new models

Not Reporting on this Outcome Measure

Outcome #3

1. **Outcome Measures**

Increased (%) adoption of onsite wastewater management plans by local communities

Not Reporting on this Outcome Measure

Outcome #4

1. **Outcome Measures**

Increased use and development (%) of locally based water quality and watershed data by community decision makers

Not Reporting on this Outcome Measure

Outcome #5

1. **Outcome Measures**

Increased adoption (%) of improved landscape management practices by targeted populations

Not Reporting on this Outcome Measure

Outcome #6

1. **Outcome Measures**

Increased testing of well water by targeted homeowner populations

Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

Increased (%) proportion of professionals and the public knowledgeable in research-based approaches to design, install, maintain and improve onsite wastewater treatment and protect water quality, public health and the environment.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
On site waste water treatment systems serve approximately 30 percent of the Rhode Island population. Old, failed, or improperly functioning on site waste water treatment systems cause nitrogen and bacterial pose a direct public and environmental health risk. Educating practitioners, regulators, decision makers, and system owners about advanced treatment technologies for on site waste water and about management approaches is needed to help raise the awareness level, and enable a shift to modern state-of-the-science approaches.

What has been done
Thirty-five training classes for RI on site waste water professionals, regulators, decision makers, and system owners
were conducted to raise awareness, improve knowledge, and expand skills. Additional training was offered at other nationally. A peer reviewed installers training curriculum was pilot tested at 2 events. URI Cooperative Extension helped establish a statewide waste water management database that local communities are using to encourage inspections, cesspool removal and repair of failing and substandard systems in water supply zones.

Results
More innovative technologies have been approved by regulatory officials and are now available in Rhode Island. Over
1,200 on site waste water practitioners were trained to in new technologies and to achieve better quality installations
during this reporting period. Approximately 900 innovative and alternative treatment technologies were installed during
the reporting period in Rhode Island alone. Thirteen Rhode Island communities are now utilizing the RIWIS, a free web-accessed waste water management database and system tracking program developed jointly through a partnership between Carmody Data Systems, Inc. and URI NEMO and NEOWTC.

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
112	Watershed Protection and Management
131	Alternative Uses of Land
133	Pollution Prevention and Mitigation

Outcome #8

1. Outcome Measures

Increase in targeted households and professionals gaining research-based knowledge of testing, treatment and protection of private well water.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
URI Home-A-Syst. Ten percent of Rhode Islanders depend on private wells for drinking water. In New England private wells serve 40
percent of the population. These residents are responsible for the quality of their own drinking water and need to be
aware of contaminant risks to their drinking water sources and how to protect against such risks. Changing property
laws and regulations in the region have increased demand for well water testing and educational materials. Education
about protecting private sources of drinking water is critical to the health and safety of families relying on private wells. Audiences include private well owners, scientists and researchers, educators, federal, state, and local policy makers, and non-profit organizations.

What has been done
Working with the Rhode Island Department of Health, we deliver private well protection education to Rhode Island residents consisting of: workshops, written materials, website, a 30-minute cable TV program, direct mail and consultations via the phone and web.
On a regional basis, we have taken the lead to coordinate the New England Private Well Water Symposium. The symposium brings together professionals working in the field of private well protection to communicate current research, share programming and educational approaches and materials, and to interact with each other in an effort
to reduce the risks associated with groundwater use to private well water users.

Results
Well workshop participants are taking action to protect their private well. For example:
52% of participants had their well water tested; 67% inspected their wellhead; and, 13% had a water treatment system installed. In addition, 76% shared the information learned at the workshop with others. Post-session symposium questionnaires indicate that attendees are applying what they learn at the symposium to: develop state
policies for private well testing; develop new content to communicate water quality and safety techniques to private
well owners; and, to develop collaborative grant proposals and projects for both research and Extension.

4. Associated Knowledge Areas

KA Code	Knowledge Area
133	Pollution Prevention and Mitigation

Outcome #9

1. Outcome Measures

Increased understanding by scientists and decision makers through publications and presentations of the management and risks of watershed nitrogen delivery.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Modeling for TMDL Development, and Watershed Based Planning, Management and Assessment. The export of nitrogen (N) from coastal watersheds can exert profound effects on the function and value of coastal estuaries. The goal of our research is to characterize the extent of in-stream nitrate removal in low gradient streams
and identify stream attributes that relate to elevated nitrate removal rates. As we gain more insight into in-stream nitrate removal, we will be able to contribute to the scientific dialog that seeks to target site-specific nitrate control strategies to locales with high potential for export to coastal waters.

What has been done
We monitored stream nitrate-N, chloride, and discharge on a monthly basis at 19 reaches within a total of seven streams in four Rhode Island watersheds. We selected 3 pairs of sites each from within the same watershed for an assessment of the effect of woody debris on in-stream de-nitrification. Ten woody debris blocks each tethered to a single brick were installed at each site. We randomly harvested three brick/block units and ran in laboratory mesocosm and microcosm experiments to assess stream de-nitrification rates.

Results
We are still awaiting final data on our mesocosm and microcosm experiments run in 2008. Our first set of data indicates that virtually all the nitrate-N was removed from the stream water in all mesocosms in the summer of 2008
after the first harvest of woody debris blocks. Even our "controls" with a woody debris block lost virtually all the nitrate-N during their incubation. Head water streams with impoundments and woody debris might have longer retention times and more fuel for de-nitrification than narrow reaches comprised primarily of riffles and runs without
impoundments, wetlands, or woody debris. The uncertainties surrounding in-stream N removal warrant further investigation of settings with extended retention times and benthic interactions.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

Outcome #10

1. Outcome Measures

Increased (%) development of research-based, place-based water resource data for use by communities and the public.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
URI Watershed Watch. Seasonal droughts, algae blooms and the spread of invasive aquatic plants have increased awareness that water
quantity and quality is a concern for the public, local, state and national decision makers. Agency resources, both staff and financial, to monitor water resources in New England have always been insufficient, while the need increases yearly. Monitoring is long-term, with best decisions based on at least 10 years of data. Detecting trends and threats to local waters is increasingly becoming the responsibility of local communities.

What has been done
Scientist-led volunteer monitors measure water clarity, temperature, oxygen content, pH and alkalinity. They collect samples for lab analysis of nutrients and bacteria. Trained volunteers document invasive and native aquatic plants, and map their distribution. Some monitor stream flow and count aquatic macroinvertebrates. Others monitor red

tide
in salt water. NE CE hosted a day-long workshop to help volunteer groups learn how to better turn their data into results and information understood by the public and decision-makers alike.

Results
Because of extension-led volunteer monitoring an extensive record of water clarity, temperature, oxygen content, nutrients and bacteria levels now exists in all NE states. In RI alone, over 7000 algae samples were collected in during the reporting year. Agencies have used the data to create regulations to protect water quality and to document poor water quality, and to help best direct their resources. Local groups have used the data to take action
to enact local ordinances to promote farm and home owner awareness and action to deal with runoff and erosion. They have formed programs to inspect incoming boats and have prevented infestations from invasive aquatic plants.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management

Outcome #11

1. Outcome Measures

Increased in the proportion of the public and professionals knowledgeable about management of storm water and using consistent educational materials to inform residents about stormwater problems and actions they can take to reduce polluted runoff.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
On site waste water treatment systems serve approximately 30 percent of the Rhode Island population. Old, failed, or improperly functioning on site waste water treatment systems cause nitrogen and bacterial pose a direct public and environmental health risk. Educating practitioners, regulators, decision makers, and system owners about advanced treatment technologies for on site waste water and about management approaches is needed to help raise the awareness level, and enable a shift to modern state-of-the-science approaches.

What has been done
Thirty-five training classes for RI on site waste water professionals, regulators, decision makers, and system owners

were conducted to raise awareness, improve knowledge, and expand skills. Additional training was offered at other nationally. A peer reviewed installers training curriculum was pilot tested at 2 events. URI Cooperative Extension helped establish a statewide waste water management database that local communities are using to encourage inspections, cesspool removal and repair of failing and substandard systems in water supply zones.

Results

More innovative technologies have been approved by regulatory officials and are now available in Rhode Island. Over
1,200 on site waste water practitioners were trained to in new technologies and to achieve better quality installations
during this reporting period. Approximately 900 innovative and alternative treatment technologies were installed during
the reporting period in Rhode Island alone. Thirteen Rhode Island communities are now utilizing the RIWIS, a free web-accessed waste water management database and system tracking program developed jointly through a partnership between Carmody Data Systems, Inc. and URI NEMO and NEOWTC.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

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

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- Comparisons between program participants (individuals, group, organizations) and non-participants

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 9

1. Name of the Planned Program

Forestry and Wildlife

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	15%		15%	
123	Management and Sustainability of Forest Resources	25%		25%	
131	Alternative Uses of Land	30%		30%	
135	Aquatic and Terrestrial Wildlife	10%		10%	
136	Conservation of Biological Diversity	20%		20%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	0.5	0.0	1.0	0.0
Actual	0.0	0.0	5.3	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**
1565	0	200930	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	202669	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

• A combination research and Extension program address key issues related to forestry and wildlife considerations in Rhode Island. Particular emphasis was on developing geospatial data and training decision makers to use GIS and GPS to assess local risks and opportunities for forest management. Economic analyses was used to explore public preferences for conservation strategies. Also, research was designed to better understand the Ruffed Grouse, vernal pond characteristics, habitat requirements of migrating song birds, dynamics related to invasive species with results enriching outreach efforts to protect these important species and their habitats.

2. Brief description of the target audience

A mixture of public policy personnel (federal and state agencies as well as town conservation, planning and management officials), local nonprofit groups involved in land management, such as conservancies, interested and involved citizens, and private landowners and high school students through training and participation in the Rhode Island Environthon. In addition, scientific peers working on similar projects are an important audience to assure that the RI work improves the dialog and insights of the broader scientific and natural resources community.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	450	1000	100	0
Actual	1271	5075	16	20

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

Year: 2009
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	0	0	
Actual	0	6	6

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Peer reviewed publications

Year	Target	Actual
2009	4	6

Output #2

Output Measure

- Fact sheets, Bulletins and newsletters

Year	Target	Actual
2009	5	3

Output #3

Output Measure

- Short courses

Year	Target	Actual
2009	4	8

Output #4

Output Measure

- Website development and refinement

Year	Target	Actual
2009	3	5

Output #5

Output Measure

- Books and monographs

Year	Target	Actual
2009	0	0

Output #6

Output Measure

- Abstracts

Year	Target	Actual
2009	3	13

Output #7

Output Measure

- Workshops and Conferences hosted

Year	Target	Actual
2009	2	4

Output #8

Output Measure

- Public presentations

Year	Target	Actual
2009	15	22

Output #9

Output Measure

- Student training

Year	Target	Actual
2009	2	20

Output #10

Output Measure

- MS Theses and PhD Dissertations

Year	Target	Actual
2009	1	6

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increased (%) GIS database usage by towns
2	Stewardship plans developed
3	Increased understanding of fish and wildlife populations (#)
4	Increased understanding by wildlife biologists, land and water managers, and regulatory agencies, through publications and talks, of how forest and water management practices affect amphibian habitat suitability within seasonal ponds.
5	Increased understanding by wildlife biologists and managers through publications and talks of how habitat quality and management practices affect populations of migrating song birds.
6	Increased understanding by wildlife biologists and other habitat managers through publications and talks on the risks of invasive species, with special emphasis on phragmites
7	Increased development of new sub aqueous soils interpretive approaches and dissemination of these approaches to other scientists and natural resource managers through publications, workshops or talks.
8	Increased understanding by wildlife biologists, NGOs, local and state officials through publications and talks on people's willingness to support ecosystems and conservation.
9	Increased (%) forest and conservation geospatial information resources, and increased usage of these resources by government organizations, NGOs and the public.

Outcome #1

1. Outcome Measures

Increased (%) GIS database usage by towns

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Stewardship plans developed

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Increased understanding of fish and wildlife populations (#)

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Increased understanding by wildlife biologists, land and water managers, and regulatory agencies, through publications and talks, of how forest and water management practices affect amphibian habitat suitability within seasonal ponds.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
"The theoretical results indicate two factors affect which groups lobby most: the size of the group, and their strength of preference. That is, it is easier for small groups of harvesters to coordinate their lobbying actions, and thus lobby to get regulations they prefer. Groups of all sizes will rely on groups with stronger opinions in the same

direction to lobby, free riding on those more passionate (which could manifest more generally as the polarization of politics). In a fishery with a smaller number of large harvesters (who would be overcapitalized relative to effective management levels), this means large harvesters lobby for and get lax regulations, leading to management failure."

What has been done

We calculated detection probabilities and identified factors controlling amphibian species occupancy at 36 seasonal ponds throughout RI. We compared hydroperiods and amphibian reproductive effort at 24 ponds within municipal well fields and 14 control ponds and initiated research on the possibility of induced groundwater recharge at the well-field ponds. One Master's thesis was completed and another is in preparation. Presentations were made at national and statewide meetings.

Results

We have produced a protocol for estimating the likelihood that each of several amphibian species will occupy a particular seasonal pond; results may be used to assess pond condition. In the Pawcatuck River watershed, seasonal pond hydroperiod was shorter, and amphibian reproductive effort lower, at well-field ponds than at control ponds, and the degree of variation was related to well-field pumping rate. We have shared our results with federal and state regulatory agencies so that future adverse effects of groundwater withdrawal on seasonal ponds may be minimized.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
135	Aquatic and Terrestrial Wildlife
136	Conservation of Biological Diversity

Outcome #5

1. Outcome Measures

Increased understanding by wildlife biologists and managers through publications and talks of how habitat quality and management practices affect populations of migrating song birds.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Managing coastal environments for migrating songbirds. Migrating song birds require suitable food sources to complete their migration and coastal lands have undergone extreme changes in vegetation, potentially imperiling migration success and fecundity for many native species.

What has been done

We conducted field experiments designed to determine (a) whether variation in refueling rates (measured by concentrations of blood lipids) of omnivorous migratory birds during stopover at different coastal New England sites is related to fruit resource abundance, (b) the fruit preference of birds during migration, and (c) hourly movement patterns of free-living radiomarked migratory birds on Block Island in relation to their fat stores and the abundance of fruits at the release site. McWilliams presented results from this research at two scientific conferences during 2008-09.

Results

Fruit preferences of birds during migration were related to nutritional quality of the fruits, and movement patterns of migratory songbirds at stopover sites depended on their fat stores and availability of fruits.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
135	Aquatic and Terrestrial Wildlife
136	Conservation of Biological Diversity

Outcome #6

1. Outcome Measures

Increased understanding by wildlife biologists and other habitat managers through publications and talks on the risks of invasive species, with special emphasis on phragmites

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Does Hybridization of Exotic Phragmites australis with Native Phragmites Result in Increased Hybrid Vigor? Invasive species threaten the integrity of New England habitats and could affect biodiversity within the state. Investigations on the potential for hybridization and resultant vigor and invasiveness of native and introduced plants will provide insights that can enable appropriate risk assessment and risk management strategies for invasives.

What has been done
"Native, introduced and Gulf Coast populations of Phragmites australis collected from around North America were reared, hand crossed with either natives or introduced populations and were also Â"selfedÂ". Seeds were collected,
stored and germinated the following spring. Tissues from these seedlings was collected, DNA extracted and microsatellite analyses conducted to determine whether hybridization had occurred. In addition, to test plant vigor, plant above and below ground biomass and flowering was quantified for all offspring."

Results
This research demonstrated, for the first time that native and introduced populations of Phragmites can hybridize. There is substantial overlap in flowering period between native and introduced populations from the same geographic locations. However, gene flow was unidirectional in that only pollen from introduced parent plants crossed with native seed parent produced viable seed Â- no such crosses were obtained in the opposite direction. These results strongly suggest that hybridization can occur in wild populations across North America and further imply a mechanism for the further decline of native Phragmites in North America and a potential for the formation of aggressive hybrid offspring.

4. Associated Knowledge Areas

KA Code	Knowledge Area
135	Aquatic and Terrestrial Wildlife
136	Conservation of Biological Diversity

Outcome #7

1. Outcome Measures

Increased development of new sub aqueous soils interpretive approaches and dissemination of these approaches to other scientists and natural resource managers through publications, workshops or talks.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Hydropedology: Genesis, Properties, and Distribution of Hydromorphic Soils. Developing sub aqueous soil use and management interpretations is critical to providing coastal managers with tools to make decisions. Of particular interest water quality, aquaculture and restoration of commercially important shellfish populations, effects of dredging, the role of subaqueous soils in the regional and global carbon cycle, and submerged aquatic vegetation health and restoration.

What has been done
"Experimental mesocosms were established with a range of dredge materials from 4 estuaries for each of 4 different
soils. Experimental plots were established to study oyster aquaculture, hard-shell clam growth, and eel grass restoration relationships relative to soil type. Carbon pools are being calculated from samples collected from selected mapping units of four estuaries."

Results
Of the soils we investigated, we learned that certain subaqueous soils should not be dredged and the dredge materials placed on the land. Long-term effects of placing dredged materials on land are still being determined. Certain subaqueous soils show the potential to grow oysters to a marketable size faster and have a larger number of oysters survive than other soils. Investigations of relationships between hard shell clam aquaculture and subaqueous soil type showed similar results. Eelgrass was difficult to re-establish through transplants regardless of soil types. Although transect data showed that the densest beds of eelgrass were on lagoon bottom soil types, growth rates suggested these plants were under the greatest stress. Carbon pools in subaqueous soils are as large or in some cases larger than most subaerial soils.

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
131	Alternative Uses of Land

Outcome #8

1. Outcome Measures

Increased understanding by wildlife biologists, NGOs, local and state officials through publications and talks on people's willingness to support ecosystems and conservation.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Hayfields and Grassland Birds: Extending Farm Marketing for a New Ecosystem Service Economy. Economic analysis of willing to pay for land for land conservation or ecosystem services is a key factor for generating management schemes and will enable the public and private sector to assess the potential for green markets.

What has been done
Preliminary results from a market for ecosystem services were presented to the Western Agricultural Economics Association, the U.S. EPA seminar series on Ecosystem Services, and A Conference on Ecosystem Services. Staff from Rhode Island's four Congressional offices were briefed. Staff for the U.S. House of Representatives and the U.S. Senate were briefed on economics of forest fire.

Results
"The experimental market for grassland nesting bird bird habitat in Jamestown Rhode Island involved 4 farms and 500
household-respondents. Results suggest a proportional rebate mechanism is most promising for creating an ecosystem service market business, with residents paying between $40 and $60 per 10-acre field as a reasonable
estimate of a household benefit."

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
131	Alternative Uses of Land
136	Conservation of Biological Diversity

Outcome #9

1. Outcome Measures

Increased (%) forest and conservation geospatial information resources, and increased usage of these resources by government organizations, NGOs and the public.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Geospatial research and technology can play an enormously important role in providing decision support for land use decision making. In particular, new GIS, GPS and remote sensing tools are continually being made available which are poised to assist local decision makers to both visualize existing and future land use patterns, and model the various impacts of these patterns. Local governments also play an important role in forest and wildlife management within Rhode Island. Policy makers and professionals need information on which to base their land use decisions, including options for land preservation, identification of sensitive areas, and the management and protection of open space areas.

What has been done
Five GIS classes were taught to 44 students who earned GIS certificates of course completion. 16 events promoting the use of geospatial technologies were organized and/or delivered. Our GPS loan program made 60 loans. 724 gigabytes of data were downloaded from the geospatial data portal. RIGIS data assisted in the acquisition and management of approximately 500 acres of land in Rhode Island.

Results
RREA programming has led to a number of tangible results. Clients who have borrowed our GPS receivers have used them for natural resource data gathering, locating and mapping historical and cultural resources, and conservation and stewardship training programs. The 724 GB of geospatial data have fueled hundreds of geospatial analysis, maps, and reports that have served the resource management community. Our training programs in geospatial technology have enhanced the technical skills of our natural resource decision-makers, practitioners, and citizens.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
131	Alternative Uses of Land
135	Aquatic and Terrestrial Wildlife
136	Conservation of Biological Diversity

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

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

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- Time series (multiple points before and after program)

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 10

1. Name of the Planned Program

Community Gardening and Outreach

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
112	Watershed Protection and Management	35%		35%	
205	Plant Management Systems	40%		40%	
806	Youth Development	25%		25%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	0.0	0.0
Actual	4.2	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**
153053	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
143403	0	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

Community Gardening and Outreach Programs flow from the Land Grant universities' diverse research expertise and address contemporary issues most important to our state. A value of lifelong learning, community engagement, and protecting the natural environment is reflected in all of the programs and services.The specialized, research-based training programs cater to a broad range of interests and skill levels. Current training and outreach programs include: Master Gardener; GreenShare; Energy Center (reported on elsewhere); Learning Landscape (youth education); Master Composter& Recycler; Coastal Landscapes; Urban Outreach @ the Roger Williams Park Botanical Center;Plant Protection Clinic; Gardening & Environmental Hotline Each program shares a commitment to presenting reliable information, providing an experience that is both interesting and transformative, and forming relationships with relevant partner groups.

2. Brief description of the target audience

Gardening is the number 1 hobby in the United States. Our Community Gardening and Outreach Program uses this passion for gardening as an avenue of communicating a wealth of information on environmental issues directly tied to behaviors at home. The Program Area delivers a range of research-based horticultural and environmental programs for the general public (consumer), the green industry, governmental agencies (local, state and regional) and youth. We work closely with RI's AES and CE programs in sustainable agriculture, water quality, natural and environmental resource economics, horticulture and the reduction of pest and disease outbreaks in plants and energy management.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	8000	250000	10000	0
Actual	8000	250000	7500	2500

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

Year: 2009
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	0	0	
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Peer reviewed publications

Year	Target	Actual
2009	3	0

Output #2

Output Measure

- Fact sheets, bulletins and newsletters

Year	Target	Actual
2009	10	14

Output #3

Output Measure

- Public service announcements, news releases/articles

Year	Target	Actual
2009	20	25

Output #4

Output Measure

- Website development and refinement

Year	Target	Actual
2009	2	7

Output #5

Output Measure

- Books and monographs

Year	Target	Actual
2009	1	0

Output #6

Output Measure

- Abstracts

Year	Target	Actual
2009	4	2

Output #7

Output Measure

- Workshops or Conferences hosted or co-hosted

Year	Target	Actual
2009	4	4

Output #8

Output Measure

- Presentations and short courses

Year	Target	Actual
2009	35	45

Output #9

Output Measure

- Student training

Year	Target	Actual
2009	3	5

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increased use and development (%) of locally based water quality and watershed data by community decision makers
2	Development of new models
3	Increased (%) of BMP approaches adopted by target audiences
4	Increased adoption (%) of improved landscape management practices by targeted population
5	Increase in target audiences (households) gaining research-based knowledge of landscape management practices that minimize contamination of surface and groundwater with pesticides and fertilizers.
6	Increase in target audiences (households) gaining research-based knowledge of landscape management practices that minimize stormwater runoff
7	Increase in target audience gaining research-based knowledge of good agricultural practices in home gardens
8	Increase in target audiences (households and youth) gaining research-based knowledge of yard and food scrap composting to reduce waste steam
9	Increased development of research-based practices for coastal landscape invasive management and restoration
10	Increased development of research based practices for coastal landscape management practices that minimize quantity and pollution of stormwater runoff
11	Increase in the proportion of green industry professionals certified in coastal landscape management and invasive management
12	Increase in research-based knowledge regarding horticulture, water quality and life sciences on the part of K-5 grade students
13	Students attending LL field trip will gain knowledge and skills associated with RI Grade Span expectations: Life, Earth and Physical Sciences, Written and Oral Communication and Environmentas Stewardship.

Outcome #1

1. Outcome Measures

Increased use and development (%) of locally based water quality and watershed data by community decision makers

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Development of new models

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Increased (%) of BMP approaches adopted by target audiences

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Increased adoption (%) of improved landscape management practices by targeted population

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Increase in target audiences (households) gaining research-based knowledge of landscape management practices that minimize contamination of surface and groundwater with pesticides and fertilizers.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Rhode Island is one of the most densely populated states in the country. Managed landscapes, including residential and other development in suburban areas, can have a significant impact on the quality and quantity of the state's drinking water as well as surface and ground water.

What has been done
We use the popularity of gardening as an avenue for communicating a wealth of information on environmental issues and provide guidelines for home practices to minimize pollution or otherwise protect the environment.

Results
Increases in awareness, knowledge
Changes in home landscape management practices.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
205	Plant Management Systems

Outcome #6

1. Outcome Measures

Increase in target audiences (households) gaining research-based knowledge of landscape management practices that minimize stormwater runoff

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management

205	Plant Management Systems
806	Youth Development

Outcome #7

1. Outcome Measures

Increase in target audience gaining research-based knowledge of good agricultural practices in home gardens

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
205	Plant Management Systems
806	Youth Development

Outcome #8

1. Outcome Measures

Increase in target audiences (households and youth) gaining research-based knowledge of yard and food scrap composting to reduce waste steam

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
205	Plant Management Systems
806	Youth Development

Outcome #9

1. Outcome Measures

Increased development of research-based practices for coastal landscape invasive management and restoration

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
205	Plant Management Systems

Outcome #10

1. Outcome Measures

Increased development of research based practices for coastal landscape management practices that minimize quantity and pollution of stormwater runoff

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
205	Plant Management Systems

Outcome #11

1. Outcome Measures

Increase in the proportion of green industry professionals certified in coastal landscape management and invasive management

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
205	Plant Management Systems

Outcome #12

1. Outcome Measures

Increase in research-based knowledge regarding horticulture, water quality and life sciences on the part of K-5 grade students

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #13

1. Outcome Measures

Students attending LL field trip will gain knowledge and skills associated with RI Grade Span expectations: Life, Earth and Physical Sciences, Written and Oral Communication and Environmentas Stewardship.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

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

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- Comparisons between program participants (individuals, group, organizations) and non-participants

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 11

1. Name of the Planned Program

Health and Well-being of Livestock

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
301	Reproductive Performance of Animals	50%		50%	
302	Nutrient Utilization in Animals	20%		20%	
305	Animal Physiological Processes	10%		10%	
311	Animal Diseases	20%		20%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	0.3	0.0	1.3	0.0
Actual	0.5	0.0	2.5	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	82748	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
45138	0	63973	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

Research in the program area focused on two areas of livestock development and health. One area was on the effect of vitamin E supplementation on parasite infection in lambs. Twenty newborn lambs were supplemented with vitamin E or placebo from birth through seven months of age and the subsequent response to and on the phenotypic expression of lymphocytes using flow cytometry was quantified. Blood was taken for vitamin E analysis, lymphocyte proliferation and immunoglobulin production. Blood and tissue samples were taken for lymphocyte isolation, cytokine production and cytokine gene expression at seven months of age. Protocol development for measurement of

cytokine production and gene expression is underway.
The second focus area was characterization of the isoforms of CREM (cyclic-AMP responsive element modulator) transcription factor in boar and bull sperm development and investigating a relationship between CREM mRNA expression levels and in vivo fertility. Using boar and bull CREM sequence determined in the initial stages of this project, we sequenced CREM isoforms with different promoters in developmental boar testis tissue. Further analysis of CREM isoforms in differentiated boar and bull sperm were investigated. A quantitative PCR assay was developed to compare expression levels of CREM isoforms among developmental stages and individual animals

2. Brief description of the target audience

The results of this research could be beneficial to the target audiences of: 1) livestock farmers in the Northeast and nationally, 2) the livestock artificial insemination industry, 3) scientists and researchers in these fields and 4) 4-H youth.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	100	1000	50	100
Actual	100	700	20	50

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

Year: 2009
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	0	0	
Actual	1	0	1

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Peer reviewed publications

Year	Target	Actual
2009	2	1

Output #2

Output Measure

- Student training

Year	Target	Actual
2009	2	13

Output #3

Output Measure

- Scientific and Professional Presentations

Year	Target	Actual
2009	2	4

Output #4

Output Measure

- Public presentations

Year	Target	Actual
2009	3	1

Output #5

Output Measure

- Website development and refinement
  Not reporting on this Output for this Annual Report

Output #6

Output Measure

- Abstracts

Year	Target	Actual
2009	2	4

Output #7

Output Measure

- Fact sheets, bulletins and newsletters

Year	Target	Actual
2009	2	0

Output #8

Output Measure

- MS Theses and PhD Dissertations

Year	Target	Actual
2009	1	2

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Development of fertility assays for use in AI industry
2	Modification of animal feeds which will result in the improvement of immune status and disease resistance

Outcome #1

1. Outcome Measures

Development of fertility assays for use in AI industry

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Infertility of livestock has a major effect on the economics of swine and cattle production. Development of tools to assess in vivo fertility would have a significant impact on the livestock industry.

What has been done
Using boar and bull CREM sequence determined in the initial stages of this project, we sequenced CREM isoforms with different promoters in developmental boar testis tissue. Further analysis of CREM isoforms in differentiated boar and bull sperm were investigated. A quantitative PCR assay was developed to compare expression levels of CREM isoforms among developmental stages and individual animals.

Results
Different CREM tau isoforms in prepubertal and adult boar testis were identified. Two different CREM isoforms are expressed in adult boar testis: CREM tau (major) and CREM tau 1 without gamma (minor). Prepubertal boar testis express activator isoforms CREM tau1 and CREM tau with the repressor CREM ά/γ. With 5'RACE, we have identified CREM isoforms with alternative start exons (P2, P3 and P4) in prepubertal and adult boar testis. Ejaculated boar sperm retains adult CREM tau mRNA isoforms, but has a shorter 3'UTR region. A quantitative PCR assay was developed to compare expression levels of CREM isoforms among developmental stages and individual animals. Our results confirm in livestock that several different CREM isoforms function during spermatogenesis but are developmentally expressed.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
305	Animal Physiological Processes

Outcome #2

1. Outcome Measures

Modification of animal feeds which will result in the improvement of immune status and disease resistance

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Parasite infection is one of the more significant causes of loss of newborn lambs. One of the hypotheses examined here is that these losses are related to less than optimum immune response. A reduction in peri-natal lamb losses would enhance economic gain to the producer.

What has been done
Work has continued to characterize the effect of vitamin E supplementation on parasite infection in lambs. In addition, 20 newborn lambs were supplemented with vitamin E or placebo from birth through seven months of age the subsequent response to and on the phenotypic expression of lymphocytes using flow cytometry was quantified. Blood was taken for vitamin E analysis, lymphocyte proliferation and immunoglobulin production. Blood and tissue samples were taken for lymphocyte isolation, cytokine production and cytokine gene expression at seven months of age. Protocol development for measurement of cytokine production and gene expression is underway

Results
There was no effect of vitamin E supplementation on total IgG or anti-tetanus IgG production however the vitamin E supplemented lambs produced a stronger, more rapid, and longer-lived response to vaccination against a novel antigen, Brucella abortus (strain 19). These results indicate that vitamin E may enhance the ability of lambs to immunogenically respond to a challenge with a novel antigen i.e. a response unimpeded by the presence of circulating maternal antibodies. There was no effect of vitamin E supplementation on lymphocyte proliferation. Vitamin E supplementation decreased expression of gamma/delta T lymphocytes in lambs, as measured by flow cytometry. Gamma/delta T lymphocytes are important in cell-mediated immune responses although their mechanism of action remains unclear. Knowledge of the immune response of lambs to vitamin E supplementation will help us to develop strategies of nutritional intervention that will ultimately improve the health and well-being of young livestock.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals

305 Animal Physiological Processes

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Other ()

Brief Explanation

No external factors affected the outcomes

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

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- During (during program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 12

1. Name of the Planned Program

Horticulture and the Reduction of Pests and Disease Outbreaks in Plants

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
103	Management of Saline and Sodic Soils and Salinity	15%		15%	
204	Plant Product Quality and Utility (Preharvest)	15%		15%	
205	Plant Management Systems	15%		15%	
211	Insects, Mites, and Other Arthropods Affecting Plants	25%		25%	
212	Pathogens and Nematodes Affecting Plants	15%		15%	
215	Biological Control of Pests Affecting Plants	15%		15%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	6.0	0.0	9.0	0.0
Actual	2.7	0.0	4.2	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**
38625	0	224337	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
303801	0	275611	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

•Identify, select or breed species and cultivars of plants which are better adapted for use in the landscapes and environment of Rhode Island and the Northeastern US.
•Develop and deliver training for green industry professionals and gardeners emphasizing the use of plants that require less water, labor, nutrients, and pesticides.

•Expand markets for resource-conserving products.
•Reduce pest-induced damage to horticultural and forest plants, while maintaining environmental quality by minimizing the use of agrochemicals.
•Develop novel non-chemical methods of controlling invasive plant species.

2. Brief description of the target audience

We have active partnerships with agricultural producers of turf grass and ornamental plants, administered by a joint advisory committee of the Plant Sciences department, the RI Nursery and Landscape Association (RINLA) and the New England Sod Producers Association. We have research and demonstration projects on several nurseries and we work closely with RINLA to determine research needs and to design educational programs. We have similar working relations with the RI Golf Course Superintendents Association. We also target consumers through educational outreach programs designed to promote acceptance of local products.

Producer and commodity groups: The Rhode Island Nursery and Landscape Association (RINLA) represents nurserymen, landscapers, tree farms and arborists. The Rhode Island Greenhouse Growers Association represents greenhouse growers and vegetable producers. The Rhode Island Fruit Growers Association represents orchards and small fruit growers.The RI Farm Bureau acts as an umbrella for RI agriculture with national links. Contacts are also maintained with regional commodity groups such as the New England Nursery Association and New England Floriculture, Inc. Given the size of the industry, there are numerous direct contacts between the Director, Station faculty and professionals (research and outreach) and industry representatives. RINLA has made major contributions to the University, including support for new hires, scholarships, and the development of a formal garden demonstrating sustainable plantings (seea virtual tour of this facility at riaes.cels.uri.edu/explore). The principle commodity groups representing turf grass production and management in Rhode Island are the Rhode Island Golf Course Superintendents Association (RIGCSA), the New England Sod Producers Association (NESPA), and the New England Regional Turfgrass Foundation (NERTF). We have strong working relationships with many of the individual golf course superintendents and sod producers throughout Rhode Island. Through our Winter School and Green Share programs, we provide annual educational and re- certification programs for growers, creating an excellent forum for exchange of information from this vital stakeholder group.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	500	20000	100	400
Actual	300	18500	230	600

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

Year: 2009
Plan: 1
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	8	5	

Actual	8	5	13

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Peer reviewed publications

Year	Target	Actual
2009	3	2

Output #2

Output Measure

- Books and monographs

Year	Target	Actual
2009	0	1

Output #3

Output Measure

- Abstracts

Year	Target	Actual
2009	5	5

Output #4

Output Measure

- Conference proceedings

Year	Target	Actual
2009	3	3

Output #5

Output Measure

- Technical documents, fact sheets and bulletins

Year	Target	Actual
2009	5	5

Output #6

Output Measure

- Workshops

Year	Target	Actual
2009	3	1

Output #7

Output Measure

- Website development and refinement

Year	Target	Actual
2009	3	5

Output #8

Output Measure

- Public presentations

Year	Target	Actual
2009	6	12

Output #9

Output Measure

- Student training

Year	Target	Actual
2009	9	19

Output #10

Output Measure

- Development of tools and germplasm for use in breeding grasses and ornamental plants with traits important for the development of sustainable landscapes

Year	Target	Actual
2009	2	0

Output #11

Output Measure

- Release of biological control agents benefiting traditional agriculture, landscape horticulture and the environment of southern New England

Year	Target	Actual
2009	1	0

Output #12

Output Measure

- MS Theses and PhD Dissertations

Year	Target	Actual
2009	2	3

Output #13

Output Measure

- Professional training

Year	Target	Actual
2009	2	3

Output #14

Output Measure

- Professional/scientific presentations

Year	Target	Actual
2009	5	4

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Identify and improve sustainable trees, shrubs, and grasses, with an emphasis on native species (#)
2	Increase availability and local production of sustainable ornamental trees and shrubs, and turf and roadside grasses (%)
3	Better understand the biology of plants and their pests, including the identification of gene functions for select traits on select crop species (# genes identified)
4	Develop and select superior and patentable ornamental plants (#)
5	Increase use of sustainable plants and IPM practices by CE-trained green industry professionals and the gardening public (%)
6	Reduce damage caused by pests through our biological control efforts, or through environmentally sensitive pesticide applications influenced by our IPM and pesticide applicator-training programs (% reduction)
7	Reduce needs for water, nutrients, or labor for select ornamental plants and grasses (%)
8	Improve landscape quality in high-stress areas through improved management practices and development of stress-tolerant plants (% adoption of BMP)
9	Increase profit from production, resulting from more efficient marketing and reduced production costs as well as alternative uses for agricultural crops (%)

Outcome #1

1. Outcome Measures

Identify and improve sustainable trees, shrubs, and grasses, with an emphasis on native species (#)

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	2	4

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Low-input and sustainable trees and shrubs are an important component of the RI and regional landscape industry. Proper selection and use of plant materials reduced pesticide use and labor inputs. The regional nursery and landscape industries request new plant materials for evaluation and marketing to consumers. URI maintains evaluation plantings of hundreds of trees and shrubs. Industry representatives use these plantings to learn new plants and present them to customers. Several national nurseries send trees each year for evaluation.

What has been done
Thirty five new tree and shrub accessions were added in the reporting period. Annual reports were prepared and sent to collaborating nurseries and the regional nursery and landscape industries. Data taken includes survival, growth in height and girth, foliage and floral characteristics, fall coloration and incidence of pest problems. This was a challenging year due to wet weather, but very good for identifying resistance to foliar disease and root rots.

Results
Over 300 industry professionals were educated on the plants being monitored at URI. More than 25 took place in workshops at the arboretum. Several hundred cuttings and seed were distributed to area nurseries for evaluation and production.

4. Associated Knowledge Areas

KA Code	Knowledge Area
103	Management of Saline and Sodic Soils and Salinity
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems

Outcome #2

1. Outcome Measures

Increase availability and local production of sustainable ornamental trees and shrubs, and turf and roadside grasses (%)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	2	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
103	Management of Saline and Sodic Soils and Salinity
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems

Outcome #3

1. Outcome Measures

Better understand the biology of plants and their pests, including the identification of gene functions for select traits on select crop species (# genes identified)

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	2	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
103	Management of Saline and Sodic Soils and Salinity
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
215	Biological Control of Pests Affecting Plants

Outcome #4

1. Outcome Measures

Develop and select superior and patentable ornamental plants (#)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
103	Management of Saline and Sodic Soils and Salinity
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
215	Biological Control of Pests Affecting Plants

Outcome #5

1. Outcome Measures

Increase use of sustainable plants and IPM practices by CE-trained green industry professionals and the gardening public (%)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	2	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
103	Management of Saline and Sodic Soils and Salinity
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants

212	Pathogens and Nematodes Affecting Plants
215	Biological Control of Pests Affecting Plants

Outcome #6

1. Outcome Measures

Reduce damage caused by pests through our biological control efforts, or through environmentally sensitive pesticide applications influenced by our IPM and pesticide applicator-training programs (% reduction)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	2	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
103	Management of Saline and Sodic Soils and Salinity
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
215	Biological Control of Pests Affecting Plants

Outcome #7

1. Outcome Measures

Reduce needs for water, nutrients, or labor for select ornamental plants and grasses (%)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	3	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
103	Management of Saline and Sodic Soils and Salinity
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
215	Biological Control of Pests Affecting Plants

Outcome #8

1. Outcome Measures

Improve landscape quality in high-stress areas through improved management practices and development of stress-tolerant plants (% adoption of BMP)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	10	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
103	Management of Saline and Sodic Soils and Salinity
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
215	Biological Control of Pests Affecting Plants

Outcome #9

1. Outcome Measures

Increase profit from production, resulting from more efficient marketing and reduced production costs as well as alternative uses for agricultural crops (%)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	20	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
103	Management of Saline and Sodic Soils and Salinity
204	Plant Product Quality and Utility (Preharvest)

205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
215	Biological Control of Pests Affecting Plants

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

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

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- 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

V(A). Planned Program (Summary)

Program # 13

1. Name of the Planned Program

Natural and Environmental Resource Economics, Markets and Policy

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
605	Natural Resource and Environmental Economics	25%		25%	
606	International Trade and Development	25%		25%	
609	Economic Theory and Methods	25%		25%	
610	Domestic Policy Analysis	25%		25%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	2.0	0.0
Actual	0.7	0.0	2.8	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**
59549	0	112237	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	206613	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

•Evaluate the impacts of ecolabeling on consumer demand for frozen seafood.
•Determine the impacts of consumer concerns of PCB contamination of farmed salmon on US import demand for farmed salmon.
•Evaluate the impact of farmed shrimp on the US market and how shrimp aquaculture is changing prices. •Investigate the impact of homogeneous resource modeling in a heterogeneous fishery by synthesizing a stochastic production frontier model with the estimation classification algorithm.
•Model spatial decisions of fishermen in the Northeast Atlantic herring fleet.

•Run experiments using the game theoretic model.

2. Brief description of the target audience

The target audience includes fishers, environmental economists, and policy makers.

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	25	500	0	0
Actual	770	600	0	10

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

Year: 2009
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	0	0	
Actual	0	3	3

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Peer reviewed publications

Year	Target	Actual
2009	4	3

Output #2

Output Measure

- Books and monographs

Year	Target	Actual
2009	0	2

Output #3

Output Measure

- Abstracts

Year	Target	Actual
2009	5	1

Output #4

Output Measure

- Conference proceedings

Year	Target	Actual
2009	2	0

Output #5

Output Measure

- M.S. theses and Ph.D. dissertations

Year	Target	Actual
2009	3	4

Output #6

Output Measure

- Professional/scientific presentations

Year	Target	Actual
2009	5	14

Output #7

Output Measure

- Student training

Year	Target	Actual
2009	5	5

Output #8

Output Measure

- Fact sheets, Bulletins and newsletters

Year	Target	Actual
2009	{No Data Entered}	1

Output #9

Output Measure

- Short courses

Year	Target	Actual
2009	{No Data Entered}	1

Output #10

Output Measure

- Website development and refinement

Year	Target	Actual
2009	{No Data Entered}	1

Output #11

Output Measure

- Workshops and Conferences hosted

Year	Target	Actual
2009	{No Data Entered}	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	M.S. and Ph. D. degree conferrals (#)
2	Estimate the spatial decision process of fisherman within the herring industry.
3	Expand seafood markets by development of new marketing ideas.
4	Identification of market niches for seafood
5	Development of decision tools to integrate management and marketing of seafood.
6	Development of alternative seafood products.
7	Increase understanding of private and public sector and scientists of approaches to expand seafood markets by development of new marketing ideas and identification of market niches for seafood
8	Increase understanding of scientists and decision makers through publications and presentations of the the outcomes of game theoretical models to identify fisheries where political intervention is likely based on the degree of heterogeneity among harvesters.

Outcome #1

1. **Outcome Measures**

M.S. and Ph. D. degree conferrals (#)

Not Reporting on this Outcome Measure

Outcome #2

1. **Outcome Measures**

Estimate the spatial decision process of fisherman within the herring industry.

Not Reporting on this Outcome Measure

Outcome #3

1. **Outcome Measures**

Expand seafood markets by development of new marketing ideas.

Not Reporting on this Outcome Measure

Outcome #4

1. **Outcome Measures**

Identification of market niches for seafood

Not Reporting on this Outcome Measure

Outcome #5

1. **Outcome Measures**

Development of decision tools to integrate management and marketing of seafood.

Not Reporting on this Outcome Measure

Outcome #6

1. **Outcome Measures**

Development of alternative seafood products.

Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

Increase understanding of private and public sector and scientists of approaches to expand seafood markets by development of new marketing ideas and identification of market niches for seafood

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
"Marketing, Trade, and Management of Fisheries and Aquaculture Resources. Effective management of our fisheries resources is critical to maintaining the health of our oceans and sustaining our recreational and commercial fishing communities. Insights from the work will generate new understanding of how to incorporate economic and market factors into fisheries and aquaculture management for the public and private sectors."

What has been done
1) Analysis of scanner data in the UK was conducted to determine whether a price premium exists for seafood certified as sustainable. 2) A survey of fisheries clients involved in certification was conducted to determine their anticipated benefits from certification. 3) An comparative analysis of the various seafood guides was undertaken to determine what implications the multitude of guides has for consumer confusion, the environmental groups which produce them, and the seafood industry. 4) A website was created to provide an education and outreach tool to inform the fisheries, aquaculture, supply chain industries as well as policy makers about the various approaches toward market-based incentives for sustainable seafood, and a downloadable resources database for literature pertaining to the subject.

Results
Output from this project is actively being used by environmental NGOs, policy makers, and industry, in their assessment of market benefits of ecolabeled seafood. It is vital in their determination whether the benefits of market-based initiatives outweigh the costs. The scallop and bluefin tuna management study has resulted in recommendation to improve current management through a rotational approach. Analysis of aqauculture perceptions is being used to inform NOAA, NGOs and the private sector regarding constraints to aqauculture development

4. Associated Knowledge Areas

KA Code	Knowledge Area

605	Natural Resource and Environmental Economics
609	Economic Theory and Methods
610	Domestic Policy Analysis

Outcome #8

1. Outcome Measures

Increase understanding of scientists and decision makers through publications and presentations of the the outcomes of game theoretical models to identify fisheries where political intervention is likely based on the degree of heterogeneity among harvesters.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
"Analysis of Conservation and Allocation Decisions in Fishery Governance. American commercial fisheries management measures have often been unsuccessful at rebuilding many stocks. We hypothesize this is because some harvesters, especially those with large, highly capitalized operations, are engaging in political action to make the management measures more lax than necessary. Our current model will help identify fisheries that will be better managed by other processes, which are less susceptible to political influence."

What has been done
"We have developed a two-stage game model of harvesters of a common pool resource. Large harvesters want to put a lot of effort into the fishery, and small harvesters are most profitable at lower levels. We have calculated the Nash equilibrium predictions in this game, and designed and implemented an experiment to test those predictions."

Results
"The theoretical results indicate two factors affect which groups lobby most: the size of the group, and their strength of preference. That is, it is easier for small groups of harvesters to coordinate their lobbying actions, and thus lobby to get regulations they prefer. Groups of all sizes will rely on groups with stronger opinions in the same direction to lobby, free riding on those more passionate (which could manifest more generally as the polarization of politics). In a fishery with a smaller number of large harvesters (who would be overcapitalized relative to effective management levels), this means large harvesters lobby for and get lax regulations, leading to management failure."

4. Associated Knowledge Areas

KA Code	Knowledge Area
605	Natural Resource and Environmental Economics
609	Economic Theory and Methods
610	Domestic Policy Analysis

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

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

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Case Study

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 14

1. Name of the Planned Program

CELS CARES

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
902	Administration of Projects and Programs	100%		100%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	2.0	0.0	2.0	0.0
Actual	2.0	0.0	2.0	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	209783	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	180277	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

The experiment station and extension developed a request for application (RFA) process that encouraged innovative, integrated proposals that meet the needs of state stakeholders. Proposals are evaluated by an internal university panel and by a panel of external experts. Infrastructure needs are also addressed by this program.

2. Brief description of the target audience

Academic faculty, university staff, graduate students, undergraduate students, university administrators

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	1000	1000	0	0
Actual	560	750	0	0

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

Year: 2009
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	0	0	
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Proposal submissions

Year	Target	Actual
2009	20	13

Output #2

Output Measure

- Proposals funded

Year	Target	Actual
2009	10	7

Output #3

Output Measure

- Requests submitted

Year	Target	Actual
2009	10	7

Output #4

Output Measure

- Requests funded

Year	Target	Actual
2009	5	6

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	New knowledge generated
2	Research and extension infrastructure built and adequately supported
3	Number of integrated research and extension projects increase
4	Cultures of research and extension merge

Outcome #1

1. Outcome Measures

New knowledge generated

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
This program supports a competitive process for the allocation of Experiment Station and Cooperative Extension projects. Importantly, these projects are both outcome and stakeholder guided.

What has been done
We solicited and supported integrated projects. These projects spanned a broad range of topics including: human nutrition; biological control of invasives; insect-borne diseases; ecological and environmental preservation; and resource economics.

Results
The results of the projects are described in the program sections of this document. Importantly, information from university-based research programs was shared directly with state stakeholders.

4. Associated Knowledge Areas

KA Code	Knowledge Area
902	Administration of Projects and Programs

Outcome #2

1. Outcome Measures

Research and extension infrastructure built and adequately supported

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Development and support of research infrastructure is critical to the continuation of ongoing programs and for the development of new knowledge, techniques, strategies, compounds and devices.

What has been done
We supported the construction of research laboratories in the University's Center for Biotechnology and Life Sciences.

Results
This cutting-edge structure supports Experiment Station research primarily in the areas of animal health, aquacultural biotechnology; and plant diseases. The building is also the home of the Rhode Island Genomics and Sequencing Center, a resource available to Station scientists who have a need for genetic analyses.

4. Associated Knowledge Areas

KA Code	Knowledge Area
902	Administration of Projects and Programs

Outcome #3

1. Outcome Measures

Number of integrated research and extension projects increase

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	0	7

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Application of university-based research is a critical step in meeting the needs of state stakeholders.

What has been done
We solicited and supported integrated projects. These projects spanned a broad range of topics including: human nutrition; biological control of invasives; insect-borne diseases; ecological and environmental preservation; and resource economics.

Results
The results of the projects are described in the program sections of this document. Importantly, information from university-based research programs was shared directly with state stakeholders.

4. Associated Knowledge Areas

KA Code	Knowledge Area
902	Administration of Projects and Programs

Outcome #4

1. Outcome Measures

Cultures of research and extension merge

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Application of university-based research is a critical step in meeting the needs of state stakeholders.

What has been done
We solicited and supported integrated projects. These projects spanned a broad range of topics including: human nutrition; biological control of invasives; insect-borne diseases; ecological and environmental preservation; and resource economics.

Results
The results of the projects are described in the program sections of this document. Importantly, information from university-based research programs was shared directly with state stakeholders.

4. Associated Knowledge Areas

KA Code	Knowledge Area
902	Administration of Projects and Programs

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

The program did not experience unmet goals. However, this program is highly sensitive to shifts in funding that might occur as a result of each of the factors identified above.

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

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)

Evaluation Results

We have developed an effective strategy to secure and assess the needs of stakeholders. The needs of the stakeholders have shaped the solicitation for projects and the selection of projects to be supported.

Key Items of Evaluation

Stakeholder input is an important element that drives the requests for projects.