2008 University of Rhode Island Combined Research and Extension Annual Report of Accomplishments and Results

Status: Accepted
Date Accepted: 07/28/09

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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).

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 cutting edge knowledge, essential services and innovative programming for all Rhode Islanders.

Total Actual Amount of professional FTEs/SYs for this State

Year:2008	Extension		Research	
	1862	1890	1862	1890
Plan	28.6	0.0	28.6	0.0
Actual	22.2	0.0	20.0	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 small panel of external experts 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.

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
- Other (Self identification)

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

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 was 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.)

Brief Explanation of what you learned from your Stakeholders

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.")

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
978525	0	1267753	0

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	975939	0	2050485	0
Actual Matching	1057956	0	1342942	0
Actual All Other	0	0	0	0
Total Actual Expended	2033895	0	3393427	0

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

V. Planned Program Table of Content

Program #1

V(A). Planned Program (Summary)

1. Name of the Planned Program

Improving the Quality of Life for Rural Rhode Islanders

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
	Total				

V(C). Planned Program (Inputs)

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

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	0.2	0.0	1.0	0.0
Actual	0.2	0.0	1.0	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

•Identify municipal partners •Convene municipal partners with University staff and faculty •Develop strategic plan for rural food insecurity investigation •Provide training to municipal partners, students and volunteers •Collect, compile and analyze community based food insecurity data (including developing food security assessment instruments)

•Publish results of work in peer reviewed journals •Publish the results of the work in public education publications (flyers, bulletins, newspaper)

•Present the results of the work at state, regional or national meetings

2. Brief description of the target audience

Policy makers (local and state government), social service agency personnel, extension educators, resident volunteers, medical service personnel, students, retail grocery personnel, emergency food providers.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	100	1000	0	0
2008	100	1100	0	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Peer reviewed publications

Year	Target	Actual
2008	1	0

Output #2

Output Measure

- Student Training

Year	Target	Actual
2008	2	2

Output #3

Output Measure

- Professional Training

Year	Target	Actual
2008	10	10

Output #4

Output Measure

- Volunteer Training

Year	Target	Actual
2008	12	12

Output #5

Output Measure

- Conferences Hosted

Year	Target	Actual
2008	1	0

Output #6

Output Measure

- Community Service Efforts

Year	Target	Actual
2008	1	0

Output #7

Output Measure

- Fact Sheets, Bulletins, Assessment Instruments

Year	Target	Actual
2008	1	0

Output #8

Output Measure

- MS Thesis or PhD Dissertation

Year	Target	Actual
2008	0	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Development and/or refinement of food security and food access survey instruments (# developed per year)
2	Assess the food security and food access status of selected rural communities in Rhode Island and develop a strategic plan to address and improve identified issues (number of communities assessed per year)
3	Develop and sustain a community based coalition of municipal personnel, community volunteers, students, faculty and private industry (including the grocery industry) to link collective resources and intellect to improve food security and food access in rural communities (number of communities with working coalitions)

Outcome #1

1. Outcome Measures

Development and/or refinement of food security and food access survey instruments (# developed per year)

2. Associated Institution Types

{No Data Entered}

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
{No Data}	

Outcome #2

1. Outcome Measures

Assess the food security and food access status of selected rural communities in Rhode Island and develop a strategic plan to address and improve identified issues (number of communities assessed per year)

2. Associated Institution Types

{No Data Entered}

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
{No Data}	

Outcome #3

1. Outcome Measures

Develop and sustain a community based coalition of municipal personnel, community volunteers, students, faculty and private industry (including the grocery industry) to link collective resources and intellect to improve food security and food access in rural communities (number of communities with working coalitions)

2. Associated Institution Types

{No Data Entered}

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
{No Data}	

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

This program is being phased out.

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)
- 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.

Evaluation Results

This program is being phased out.

Key Items of Evaluation

None

Program #2

V(A). Planned Program (Summary)

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: 2008	**Extension**		**Research**	
	1862	**1890**	**1862**	**1890**
Plan	1.8	0.0	0.0	0.0
Actual	2.0	0.0	0.8	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**
102881	0	21603	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
129928	0	44598	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, food service workers and managers, school food service, 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

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	350	1000	500	1000
2008	200	450	250	400

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	1

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	0	1	1

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Peer Reviewed Publications

Year	Target	Actual
2008	1	5

Output #2

Output Measure

- Abstracts

Year	Target	Actual
2008	1	5

Output #3

Output Measure

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

Year	Target	Actual
2008	15	12

Output #4

Output Measure

- Volunteer Training

Year	Target	Actual
2008	10	4

Output #5

Output Measure

- Conferences Hosted

Year	Target	Actual
2008	1	1

Output #6

Output Measure

- School Based Training Sessions (teachers and children)

Year	Target	Actual
2008	3	3

Output #7

Output Measure

- Website Development and Refinement

Year	Target	Actual
2008	1	1

Output #8

Output Measure

- Student training

Year	Target	Actual
2008	1	2

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Provide food safety training to commercial growers of fruit and vegetables, food industry producers and school personnel (# trainings per year)
2	Develop and test internet based training for GMP and personal hygiene for processors and warehouses.
3	Formulate new approaches to food safety education for consumers, schools and the food industry in Rhode Island
4	Survey of healthcare professionals to measure knowledge of health implications of the consumption of seafood.
5	Development of pigments for time-temperature indicator barcodes for food safety.

Outcome #1

1. Outcome Measures

Provide food safety training to commercial growers of fruit and vegetables, food industry producers and school personnel (# trainings per year)

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	5	12

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

State and/or federal regulatory requirements and guidance.

What has been done

Training using standardized curriculum and regulation/guidance.

Results

Maintained or expanded business; increased food safety knowledge.

4. Associated Knowledge Areas

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

Outcome #2

1. Outcome Measures

Develop and test internet based training for GMP and personal hygiene for processors and warehouses.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

All food industries regulated by FDA and USDA.

What has been done

Internet course was developed, reviewed, and is currently being implemented.

Results

Internet course is available through Cornell University distance learning.

4. Associated Knowledge Areas

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

Outcome #3

1. Outcome Measures

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

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Professionals and educators who share food safety and health information with the public and children.

What has been done

Performed assessments, developed materials, and trained target audiences.

Results

Needs assessments have resulted in the development of effective training and materials.

4. Associated Knowledge Areas

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

Outcome #4

1. Outcome Measures

Survey of healthcare professionals to measure knowledge of health implications of the consumption of seafood.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	20

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Healthcare provider network and their clientele need to understand the health implications of consuming seafood.

What has been done

Performed assessments

Results

Statistical assessments currently underway to direct future outreach programming.

4. Associated Knowledge Areas

KA Code	Knowledge Area
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #5

1. Outcome Measures

Development of pigments for time-temperature indicator barcodes for food safety.

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

One of the most important aspects of food safety is maintaining the proper handling and storage temperature of food products.

What has been done

Pigments were developed that will continuously monitor the temperature of food products.

Results

Time-temperature barcodes including the thermal sensor pigments were developed to monitor the temperature of food during transportation and storage.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

Program #3

V(A). Planned Program (Summary)

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: 2008	**Extension**		**Research**	
	1862	**1890**	**1862**	**1890**
Plan	0.3	0.0	0.5	0.0
Actual	0.8	0.0	2.1	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**
26368	0	124401	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
68528	0	73539	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 test meal trials.

For KA 703:

- Facilitate partnership with Latino communities •Develop curriculum and teacher training programs •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

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	400	0	500	0
2008	380	0	0	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	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
2008	1	0

Output #2

Output Measure

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

Year	Target	Actual
2008	0	1

Output #3

Output Measure

- Refine, deliver and evaluate major healthy weight intervention study

Year	Target	Actual
2008	1	1

Output #4

Output Measure

- Develop and refine techniques to investigate metabolic and hormonal mechanisms related to sugar consumption and weight outcomes

Year	Target	Actual
2008	1	1

Output #5

Output Measure

- Conduct metabolic studies

Year	Target	Actual
2008	1	1

Output #6

Output Measure

- Peer reviewed publications

Year	Target	Actual
2008	2	2

Output #7

Output Measure

- Abstracts

Year	Target	Actual
2008	1	2

Output #8

Output Measure

- Workshops

Year	Target	Actual
2008	1	40

Output #9

Output Measure

- Student Training

Year	Target	Actual
2008	3	3

Output #10

Output Measure

- Professional Training

Year	Target	Actual
2008	1	0

Output #11

Output Measure

- Scientific and Professional Presentations

Year	Target	Actual
2008	1	2

Output #12

Output Measure

- MS Thesis or PhD Dissertation

Year	Target	Actual
2008	1	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Create healthy weight assessment tools and intervention programs
2	Raise awareness and knowledge of healthy weight issues in the Latino population in Rhode Island (% change from baseline)
3	Increase maintenance of healthy weight among intervention participants (% achieving and maintaining healthy weight)
4	Increase understanding of metabolic and hormal mechanisms related to sugar consumption and weight outcomes
5	Increase research funding for obesity and weight studies by 10% each year
6	Identify factors contributing to overweight and obesity in the Latino population
7	Increase understanding of lipoprotein metabolism and metabolic syndrome on human health in young adults.

Outcome #1

1. Outcome Measures

Create healthy weight assessment tools and intervention programs

Not reporting on this Outcome for this Annual Report

Outcome #2

1. Outcome Measures

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

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	20	20

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Barriers and facilitators to healthy eating and activity were identified and incorporated into culturally sensitive interventions for latinos.

What has been done

Interventions conducted in target audience.

Results

Measurable changes were seen in target audience.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #3

1. Outcome Measures

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

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	20	72

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Decrease excessive weight in latino population to reduce disease risk and improve overall health.

What has been done

Eight-week intervention with 18 week follow-up with 72 latinas.

Results

Program was effective in decreasing body weight, waist circumference, and BMI among overweight latinas.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #4

1. Outcome Measures

Increase understanding of metabolic and hormal mechanisms related to sugar consumption and weight outcomes

Not reporting on this Outcome for this Annual Report

Outcome #5

1. Outcome Measures

Increase research funding for obesity and weight studies by 10% each year

Not reporting on this Outcome for this Annual Report

Outcome #6

1. Outcome Measures

Identify factors contributing to overweight and obesity in the Latino population

Not reporting on this Outcome for this Annual Report

Outcome #7

1. Outcome Measures

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

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	85

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Prevalent risk factors for chronic disease is largely unknown in college-aged students as are the ways to improve their risk profile.

What has been done

Data collection on 225 University of Rhode Island students is underway. Variables include height/weight, lipid profile, blood glucose, diet measures, etc.

Results

Data is currently being collected.

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

Program #4

V(A). Planned Program (Summary)

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: 2008	**Extension**		**Research**	
	1862	**1890**	**1862**	**1890**
Plan	4.0	0.0	2.0	0.0
Actual	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		**Research**	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
0	0	0	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.

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

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	4000	100000	5000	10000
2008	6500	225000	6000	100000

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	2	0	
2008	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Peer reviewed publications

Year	Target	Actual
2008	2	0

Output #2

Output Measure

- Abstracts

Year	Target	Actual
2008	0	1

Output #3

Output Measure

- Scientific/Professional presentations

Year	Target	Actual
2008	1	0

Output #4

Output Measure

- Website Development and Refinement

Year	Target	Actual
2008	1	1

Output #5

Output Measure

- Public Service Announcements and Social Marketing Campaigns

Year	Target	Actual
2008	1	1

Output #6

Output Measure

- Video Productions

Year	Target	Actual
2008	2	3

Output #7

Output Measure

- Curriculum Development and Delivery

Year	Target	Actual
2008	1	6

Output #8

Output Measure

- Fact Sheets, Bulletins and Newsletters

Year	Target	Actual
2008	20	42

Output #9

Output Measure

- Student Training

Year	Target	Actual
2008	4	7

Output #10

Output Measure

- Volunteer Training

Year	Target	Actual
2008	15	32

Output #11

Output Measure

- Workshops and Programs

Year	Target	Actual
2008	120	750

Output #12

Output Measure

- MS Thesis or PhD Dissertation

Year	Target	Actual
2008	1	4

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 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1000	2057

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Health risks and subsequent medical costs associated with obesity and poverty continue to increase.

What has been done

Programming has targeted adults and children with limited resources (nutrition education, social marketing, distance information transfer and mass media).

Results

Increase in consumption of fruits and vegetables, increase in physical activity and improved food safety practices.

4. Associated Knowledge Areas

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

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

Program #5

V(A). Planned Program (Summary)

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: 2008	**Extension**		**Research**	
	1862	**1890**	**1862**	**1890**
Plan	6.0	0.0	0.0	0.0
Actual	4.5	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**
294533	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
198021	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

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	1000	2000	2000	3000
2008	874	1022	1708	2873

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Workshops

Year	Target	Actual
2008	30	66

Output #2

Output Measure

- Volunteer Training (number of new volunteers per year)

Year	Target	Actual
2008	50	26

Output #3

Output Measure

- 4-H Record Book Submissions

Year	Target	Actual
2008	200	127

Output #4

Output Measure

- Youth reached through programs

Year	Target	Actual
2008	1000	2329

Output #5

Output Measure

- Number of community/family serving groups and organizations reached

Year	Target	Actual
2008	25	44

Output #6

Output Measure

- Number of referrals

Year	Target	Actual
2008	100	120

Output #7

Output Measure

- Community Service (# of projects per year)

Year	Target	Actual
2008	50	60

Output #8

Output Measure

- Activities and Programs (# per year)

Year	Target	Actual
2008	25	61

Output #9

Output Measure

- Student Training (# per year)

Year	Target	Actual
2008	20	28

Output #10

Output Measure

- Website development and refinement

Year	Target	Actual
2008	2	2

Output #11

Output Measure

- Curriculum development and delivery

Year	Target	Actual
2008	1	24

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 Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	30	40

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Out of school educational programs provide youth with a safe, supportive environment for developing academic and life skills. 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 a math and science classes. in addition to the traditional 4 H Club system, URI/CELS CE program targets minority urban youth with science enrichment programming.

What has been done

The 4 H Pathways for Success in Science and Technology (PSST) after school program is held at 3 urban middle schools and a community site. URI undergrads serve as mentors and teachers to middle school students with field trips to URI science labs plus a summer science camp. Science education within 4 H animal programs was increased through the use of quiz bowl, hippology and judging sessions as well as knowledge tests at 4 H Fairs and workshops for youth and volunteers.

Results

99 urban middle school minority students participated in hands on science education one day a week during the school year. ANOVA test with a return rate of 45% yielded the following result: increase in knowledge and skills and a positive increase in attitude towards science and learning. 72% of animal science 4 H members who completed species knowledge tests, received mastery scores of 50% or greater(1 out of 5 animal science 4 H members). Improved scores in judging hippology and quiz bowl programs demonstrated an increase in knowledge from the previous year. Emphasis on science education increased attendance by youth and volunteers at animal, plant and environmental science workshops.

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
2008	30	40

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 will allow them to develop valuable life skills while creating connections to the larger community and aiding them in successfully making the transition to productive, contributing 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 clubs may apply for 4 H Foundation support for their projects. Members are asked to document their community service hours in their record books.

Results

20 4 H Clubs (40% of active 4 H clubs in RI) reported carrying out an average of 3 community service projects for FY08. 127 4 H members (13% of 4 H enrolled youth)documented a total of 3307 community service hours in their record books (submitted to state for awards and county medals). 443 4 H club members listed Community Service as a project for FY08. Two 4 H Clubs received and completed Cumberland Farm Grants to support military families (Hero Pack project)and provide support to the elderly in their community.

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 Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	25	26

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Many youth are lacking in school and family centered 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 youth to develop confidence and incorporate these life skills into their school and community.

What has been done

All 4 H members are encouraged to participate in the RI 4 H Public Presentations Program (club, district and/or state level). 4 H volunteers and staff provide training to youth and competitive and non competitive speaking and demonstration opportunities(District and State contests, 4 H Goes to the Zoo and the Fair Farm School). 4 H teens are encouraged to accept leadership roles in their 4 H club and with younger members at district and state events.

Results

107 4 H members (12% of RI enrolled 4 Hers) participated in the district public presentation contests with 86% of the 42 youth competing at state receiving a score of 85% or higher (Danish Blue). 4 H teens demonstrated their leadership skills and confidence by assuming major rolls as Teen Leaders in the animals science project and at 4 H fairs and the Eastern States Exposition. 4 H teens (including National 4 H Conference delegates)assisted staff in planning and implementing the URI/CELS 4 H Junior Conference and the state Teen Overnight (planning, conducted workshops, organized activities and/or served as group leaders). Not documented but observed is the leadership development and confidence building that occurs in the 4 H clubs through serving as club officers, presenting to other club members, chairing or serving on club committees and other leadership opportunities created by 4 volunteers and older teens.

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
2008	30	80

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The number of RI children living in poverty continues to increase. Family structures are stressed by poverty and a decreasing community connection creating a weakened environment for child rearing. There is limited access to social programs for youth and families and links between service providers and families has decreased.

What has been done

2008 Family Liaisons to work with families from the College Crusade of RI identified parent education workshops needed. These needs along with the needs identified by Parent to Parent Support groups from 2007 provided the impetus for the development of thirty, two hour workshops for direct service parent education classes, child care staff development classes as well as train the trainer methodology for Family Liaisons.

Results

Professional staff development for agency staff (121 staff from 25 agencies, parenting education classes(172 parents participated) and direct training for URI undergraduate students was delivered. Sample topics/curricula included:Using Positive Discipline with Children, How to Talk so Children will Listen, Building Values in Children, Math, Math and More Math, Self Esteem, Understanding Diversity, Education Terminology Every Parent Should Understand, The Challenge of being a Parent, Working with School Age Youth: Disciplining Techniques, Parenting Strategies, and Parental Involvement = School Success. Power point educational classes were conducted in English with Spanish translation. New 4 H volunteers (26 adults) increased knowledge through training in 'Ages and Stages', risk management and supporting resource materials/curricula.

4. Associated Knowledge Areas

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

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
2008	25	25

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The number of children in poverty continues to increase in Rhode Island. Family structures are stressed by poverty and a decreasing community connection creating a weakened environment for child rearing. Parents lack skills in teaching their children limits, how to avoid violence, cope with peer pressure and experimentation with destructive behaviors. On going and caring relationships, both within and out side of the family are essential to positive youth development.

What has been done

Agency survey and Parent to Parent Support group surveys to determine relationship between perception of community, parenting style, levels of instrumental and emotional support, usage of community resources and attendance at workshops. Developed/delivered 30 workshops.

Results

150 useable surveys to assess Parents will learn and adopt more effective methods of parental discipline and better use of family time. Workshops conducted for 504 adults and parents: topics included: Challenges of Parenthood, Providing Structure and Nurturance, Positive Guidance and Discipline, Social and Emotional Development and Self Esteem. Pre/post tests were administered at workshops assessed the quality of the workshop, presenters and information provided. 97% of respondents rated the workshop quality as Great or Perfect,98% rated the presenter quality as Great to Perfect and 80%reported learning new parenting skills. Compared to parents not attending, parents attending these workshops engage significantly in more nurturing parenting and less harsh parenting styles.

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.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	15	80

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Family structures are stressed by poverty and a decreasing community connection creating weakened environments for child rearing. By connecting families to the educational resources of their land grant institution and community based organizations, parents will be empower, through knowledge and improved parenting skills, to directly impact the health and well being of their family members and community.

What has been done

High school students were trained through a community service child care project utilizing CYF curricula Pre School to age 5 and then volunteered 220 hours in day care centers in their respective school districts receiving 6 undergraduate credits after submitting portfolios.

Results

37 high school seniors participated in the community service child care project college credit option from 8 RI high schools and worked with 1098 children in preschool through grade 5. 37 student portfolios were completed for credit. 98% of the high school seniors received a portfolio grade of B+ or above and 70% of the seniors have been referred to college and transferring the 6 credits as either free elective or child development credits.

4. Associated Knowledge Areas

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

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 Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	2	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The development of 'pre post' evaluation tools to assess increase in knowledge and skills and practice change within the parenting families and provider staff has been defined as one evaluation tool to address the change in behavior from a harsh style to more nurturing style. Two other evaluation tools were implemented, focus groups to assess community needs of families, and portfolios to assess senior high school students.

What has been done

Pre post evaluation tools, focus groups and portfolios were used to document change in knowledge. Programs/audiences targeted were high school students (community service child card project) parents and provider staff(direct service parenting classes and professional staff development workshops)and 4 H PSST project(CYFAR middle school science enrichment program). ANOVA was used to analyze the 4 H PSST program.

Results

37 seniors from 8 RI schools participated in the community service child care project. 37 portfolios were completed for credit. 98% of received a portfolio grade of B+ or above and 70% were referred to college and transferring 6 credits as free elective or child development credits. Parents and provider staff attending CE children, youth and family workshops completed pre post tests with 80% of workshop participants reported having learned new parenting skills (Compared to parents who have not attended CE workshops, parents who have attended parenting workshops engage in significantly more nurturing parenting and less harsh parenting styles. ANOVA test with a return rate of 45% yielded the following result : increase in knowledge and skills and a positive increase in attitude towards science and learning.

4. Associated Knowledge Areas

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

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

The RI CFF Program area developed the 2007 POW with anticipated outputs and outcomes based on the projected new vision and planning process that continued through FY07 and into FY08. During this period programming by the 4-H staff and Family Life Specialist (including CYFAR grant) continued based on the previous POW and with an eye to the future of a united (one team one plan). These two program groups had functioned independently of each other but collaborate on the CYFAR 4-H PSST funded program. Collaboration is still be a priority but the 2 programming units do not to function as one unit except on the CYFAR funded project. Family Life Specialists have been relocated to the URI College of Human Science and Services, with the faculty from the Human Development and Family Studies Department.

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

Program evaluation results are included in the Outcomes section - no additional evaluation studies were conducted in FY08.

Key Items of Evaluation

Program #6

V(A). Planned Program (Summary)

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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	1.0	0.0	0.0	0.0
Actual	0.8	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
75550	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

•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

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	500	10000	0	500
2008	1000	10000	50	500

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Identify new muncipal partners

Year	Target	Actual
2008	1	2

Output #2

Output Measure

- Conduct Community based workshops

Year	Target	Actual
2008	8	9

Output #3

Output Measure

- Professional training

Year	Target	Actual
2008	6	10

Output #4

Output Measure

- Public presentations

Year	Target	Actual
2008	5	7

Output #5

Output Measure

- Website development and refinement

Year	Target	Actual
2008	1	1

Output #6

Output Measure

- Student Training

Year	Target	Actual
2008	1	10

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

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	5	4

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Preserving our natural resources while accommodating the needs of municipalities and the citizenry requires thoughtful planning and proactive management. Effective municipal planning will both provide for the developing needs of communities and preserve our land, air, and water resources for future generations.

What has been done

The URI sustainable communities program has been present at 4 events that include representatives from municipalities and has encouraged intentional city planning with respect to natural resource utilization. We have also promoted agriculture as an industry that accomplishes many municipal and environmental goals simultaneously.

Results

Municipalities have received information regarding the necessity of integrating natural resource conservation/preservation into city planning processes.

4. Associated Knowledge Areas

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

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

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	15

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Agriculture is important to the health of our communities physically, aesthetically, and economically. Without proper estate planning and/or participation in emerging economic opportunities, farmers will fail and communities will lose the unique benefits this industry provides.

What has been done

The URI agricultural extension agent has provided one-on-one training as well as group training to farmers on estate planning and emerging economic opportunities in agriculture. She has also referred farmers to the RI Small Business Institute who is offering business planning services gratis to farmers.

Results

At least six farmers have participated in business planning activities as a result of initial information about such services. Many are implementing estate transfer plans. Several farmers are also investigating/participating in 'new' agricultural business opportunities after receiving information on such practices.

4. Associated Knowledge Areas

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

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

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	50

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

New England farmers face many unique challenges: lack of available agricultural land, minimal support structure, intense economic pressure from developers and non-farming neighbors. A successful agricultural industry is an integral part of our history and our present; it benefits our communities and our environment to also make it sustainable for our future.

What has been done

The URI agricultural extension agent has provided one-on-one consulting, group training, and referrals to farmers on every aspect of running an agri-business. She has participated in state and regional working groups and committees committed to identifying and solving problems in local agriculture.

Results

Rhode Island farmers have increasingly initiated contact with the extension agent regarding production issues and business strategy. The number of farms in Rhode Island is rapidly increasing, and consumer interest in local agriculture is at an all-time high. Local and regional groups continue to invite the agent's participation in agricultural planning sessions and support structures.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management

605	Natural Resource and Environmental Economics
602	Business Management, Finance, and Taxation
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

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

For effective community development to co-exist with a vibrant agricultural sector, cooperation between municipal leaders and citizens is essential.

What has been done

The URI agricultural extension agent has participated in an NRCS-led partnership meeting designed to plan a more cohesive, state-wide approach to combining agriculture, city planning, and conservation efforts.

Results

At least six farmers have participated in business planning activities as a result of initial information about such services. Many are implementing estate transfer plans. Several farmers are also investigating/participating in 'new' agricultural business opportunities after receiving information on such practices.

4. Associated Knowledge Areas

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

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.)
- Other (Staffing changes)

Brief Explanation

In a time of generally adverse economic conditions, the current interest in local foods and sustainable communities has led to a generally successful program. Our trainings have been well-received and well-attended, and our participation in local and regional collaborations has led to greater visibility for our program and our mission. Our university has seen some significant staffing changes, however, which is leading to a shift in focus from community planning in general to community planning with an emphasis on the concurrent role of agriculture. Our objectives for next year will focus primarily on agricultural-centered activities and outcomes.

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

Our key items of evaluation include post-training evaluation forms. Overwhelmingly, our evaluations have shown great interest in the topics presented and a desire for more programs with similar emphases.

Key Items of Evaluation

Program #7

V(A). Planned Program (Summary)

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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	1.0	0.0	2.0	0.0
Actual	1.2	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
17215	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
88003	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

- Use surveillance data accumulated over a dozen years to develop new tools to pinpoint risk, both spatially and seasonally.
- Use computer models to view disease patterns in Rhode Island and to develop models for disease risk.
- Determine landscape patterns that present the greatest risk for encountering a tick bite.
- Formulate landscape plans to reduce the chances of encounters between ticks and people.
- Create a web-based decision support system. Using this system, people will be able to compile a customized risk index and then follow links that will help them devise short- and long-term disease prevention action plans.
- Reduce tick abundance community-wide by using USDA-designed 4-posters, which are devices that attract deer with corn dispensed in small amounts.
- Study the salivary glands of ticks to find compounds from ticks with potential pharmacological value, formulate novel vaccination strategies to prevent tick-transmitted infections, develop biomolecular assays for tick-borne pathogens, elucidate transmission dynamics of pathogens among tick vectors and vertebrate hosts, and discover and evaluate natural enemies of ticks.

2. Brief description of the target audience

The target audience will be diverse and will represent all Rhode Islanders, especially those at greatestrisk of contracting vector borne diseases.This audience will include:

Community members

Grassroots agencies

Municipal and State Policy Makers

Home owners

Educational Institutions

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	**Target**	**Target**	**Target**	**Target**
Plan	100	10000	100	5000
2008	2982	53000	251	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	1	2	3

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Peer reviewed publications

Year	Target	Actual
2008	3	3

Output #2

Output Measure

- Books and monographs

Year	Target	Actual
2008	0	0

Output #3

Output Measure

- Abstracts

Year	Target	Actual
2008	4	8

Output #4

Output Measure

- Conference proceedings

Year	Target	Actual
2008	1	1

Output #5

Output Measure

- Workshops

Year	Target	Actual
2008	10	11

Output #6

Output Measure

- Website development and refinement

Year	Target	Actual
2008	1	1

Output #7

Output Measure

- Public presentations

Year	Target	Actual
2008	3	14

Output #8

Output Measure

- Public service announcements

Year	Target	Actual
2008	2	3

Output #9

Output Measure

- Student training

Year	Target	Actual
2008	2	10

Output #10

Output Measure

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

Year	Target	Actual
2008	1	1

Output #11

Output Measure

- Postdoctoral fellow training

Year	Target	Actual
2008	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

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
2008	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Many Rhode Islanders are at risk for tick borne diseases (e.g., Lyme disease, babesiosis, erlichiosis.) These diseases have, and continue, to cause sickness and death.

What has been done

We have mapped and identified areas of high tick density in Rhode Island. We also have developed strategies to reduce tick encounter risk.

Results

We share tick density risk maps and tick-bite protection strategies with Rhode Islanders through our website: http://www.tickencounter.org/.

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
2008	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Many Rhode Islanders are at risk for tick borne diseases (e.g., Lyme disease, babesiosis, erlichiosis. These diseases have and continue, to cause sickness and death.

What has been done

We have created a tick surveillance database.

Results

We have used the tick surveillance database to identify areas of risk for tick borne diseases in Rhode Island.

4. Associated Knowledge Areas

KA Code	Knowledge Area
722	Zoonotic Diseases and Parasites Affecting Humans
721	Insects and Other Pests 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
2008	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Many Rhode Islanders are at risk for tick borne diseases (e.g., Lyme disease, babesiosis, erlichiosis. These diseases have and continue, to cause sickness and death.

What has been done

We have created a web-based decision support system http://www.tickencounter.org/prevention/.

Results

Based on the number of hits on the website, we know that Rhode Islanders are using the decision support system.

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
2008	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Many Rhode Islanders are at risk for tick borne diseases (e.g., Lyme disease, babesiosis, erlichiosis. These diseases have and continue, to cause sickness and death.

What has been done

We have developed a web-based system for Rhode Islanders that describes strategies for eliminating tick habitat and controlling ticks.

Results

We expect that a reduction in the incidence of tick bites and vector borne diseases will be indicative of a reduction in tick abundance. Field based surveys show yearly variation in tick abundance.

4. Associated Knowledge Areas

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

Outcome #5

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Many Rhode Islanders are at risk for tick borne diseases (e.g., Lyme disease, babesiosis, erlichiosis. These diseases have and continue, to cause sickness and death.

What has been done

We continue to characterize the salivary glands of deer ticks. Specifically, we continue to investigate the tick's salivary transcriptome.

Results

We have identified a number of salivary antigens using a suite of high-throughput screening tools. These antigens are candidates for anti-tick vaccines.

4. Associated Knowledge Areas

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

Outcome #6

1. Outcome Measures

Formulate novel vaccination strategies to prevent tick-transmitted diseases

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Many Rhode Islanders are at risk for tick borne diseases (e.g., Lyme disease, babesiosis, erlichiosis. These diseases have and continue, to cause sickness and death.

What has been done

We continue to characterize the salivary glands of deer ticks. Specifically, we continue to investigate the tick's salivary transcriptome. A few molicules have been advanced for more intensive study (cystien protease inhibitor).

Results

We have identified a number of salivary antigens using a suite of high-throughput screening tools. These antigens are candidates for anti-tick vaccines. Invention disclosure to URI Intellectual Property Committee Nov. 2008.

4. Associated Knowledge Areas

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

Outcome #7

1. Outcome Measures

Elucidate transmission dynamics of pathogens among tick vectors

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Many Rhode Islanders are at risk for tick borne diseases (e.g., Lyme disease, babesiosis, erlichiosis. These diseases have and continue, to cause sickness and death.

What has been done

We have determined that several ecological factors are likely to affect tick abundance and, hence, transmission of disease.

Results

We provided Rhode Islanders with access to information to reduce and prevent the incidence of tick borne diseases.

4. Associated Knowledge Areas

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

Outcome #8

1. Outcome Measures

Increase research funding

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	5	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Many Rhode Islanders are at risk for tick borne diseases (e.g., Lyme disease, babesiosis, erlichiosis. These diseases have and continue, to cause sickness and death.

What has been done

Grant proposals have been submitted to several agencies including: URI AES, USDA-CSREES and the NIH.

Results

New funds were secured to help continue these important research and outreach programs.

4. Associated Knowledge Areas

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

Program #8

V(A). Planned Program (Summary)

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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	0.5	0.0	2.0	0.0
Actual	1.3	0.0	2.2	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
59018	0	51945	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
10287	0	160947	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 was conducted to investigate the causes of specific diseases of shellfish and performance of disease resistant strains. Specifically, the role of matrix metalloproteinases in the important process of innate immunity of oysters was investigated. Additionally, research was conducted examining the utilization of squid hydrolysate, a byproduct of processing, as a feed ingredient for marine fish larvae. Research also was conducted to investigate genetic factors controlling muscle growth in rainbow trout, e.g., myostatin.

2. Brief description of the target audience

The target audience for this research was the aquaculture industry, commercial producers and distributors, scientists and regulatory agencies (e.g., Rhode Island Department of Environmental Management).

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	200	1000	75	0
2008	150	1000	50	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	0	2	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Peer Reviewed Publications

Year	Target	Actual
2008	3	0

Output #2

Output Measure

- Books and Monographs

Year	Target	Actual
2008	0	0

Output #3

Output Measure

- Abstracts

Year	Target	Actual
2008	2	3

Output #4

Output Measure

- Scientific and Professional Presentations

Year	Target	Actual
2008	2	4

Output #5

Output Measure

- Workshops

Year	Target	Actual
2008	2	0

Output #6

Output Measure

- Website development and refinement

Year	Target	Actual
2008	1	0

Output #7

Output Measure

- Student training

Year	Target	Actual
2008	3	4

Output #8

Output Measure

- MS theses and PhD dissertations

Year	Target	Actual
2008	1	2

Output #9

Output Measure

- Postdoctoral fellow training

Year	Target	Actual
2008	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 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The potential to increase aquaculture production in the state of RI is significant. Increased production of shellfish and finfish creates new jobs and entrepreneurs which can help offset the decline in traditional capture fisheries in the state.

What has been done

Research was conducted to gain better understanding of the mechanisms of disease resistance of oysters and muscle growth in trout, a model aquaculture species. Additionally, research was conducted to examine the use of squid byproduct from the commercial fishing industry in larval fish feed.

Results

These research projects on oysters and trout have provided important information on the mechanisms of growth and immunity that have the potential to be translated into practical applications in the future. The squid hydrolyzate research has provided a potential outlet for this commercial fishery by product.

4. Associated Knowledge Areas

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

Outcome #2

1. Outcome Measures

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

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

This area is no longer active.

What has been done

Results

4. Associated Knowledge Areas

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

Outcome #3

1. Outcome Measures

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

Not reporting on this Outcome for this Annual Report

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Appropriations changes

Brief Explanation

No external factors significantly impacted the ability to conduct the research or the outcomes.

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

1. Evaluation Studies Planned

- Retrospective (post 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

The evaluations indicate that researchers and participants in the aquaculture industry are interested in receiving information on any practices that might enhance production and ultimately, economic gain.

Key Items of Evaluation

Program #9

V(A). Planned Program (Summary)

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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	0.5	0.0	1.0	0.0
Actual	0.5	0.0	5.5	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
52255	0	227474	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
23138	0	257403	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 addresses key issues related to forestry and wildlife considerations in Rhode Island.

Research includes:
Assessment of the impacts of urbanization on seasonal woodland ponds along a disturbance gradient, with special emphasis on impacts of groundwater withdrawal on pond hydrology and amphibian habitat suitability;

Economic analyses of willingness to pay for land conservation or ecosystem services generates new knowledge in relationship to people's willingness to support ecosystems and conservation and to assess the potential for green markets.

Investigations on habitat quality in early successional forests explore how management practices affect populations of grouse, woodcock and associated wildlife species.

Research on changes in body composition and blood metabolites evaluates the quality of available forest habitats and food sources for migrating song birds at stop over sites in Coastal New England and provides insights for managing coastal habitats for enhancing biodiversity.

Investigations on the potential for hybridization and resultant vigor and invasiveness of native and introduced plantsprovides insights that can enable appropriate risk assessment and risk management strategies for invasives.

Development of subaqueous soils interpretive approaches improves decisions on such issues as eelgrass restoration, dredging and aquaculture.

Extension work is designed to:
Raise the awareness of forest owners, local decision makers, NGOs and state officials about the value of RI's forest resource and to provide our audience with the tools and educational materials to make informed decisions that protect and enhance the state's forests.

Provide training in geospatial technologies (geographic information systems, remote sensing, and global positioning systems), and geospatial data via URI Environmental Data Center websites, to planners, conservation groups, and land trusts at the municipal level to increase awareness of vital natural resources and critical habitats, including forest resources throughout the State.

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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.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	400	1000	100	0
2008	665	1850	20	1750

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	1

Patents listed

Provisional Patent application filed: Revenue Raising Auction Processes for Public Goods

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	1	3	4

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Peer reviewed publications

Year	Target	Actual
2008	4	9

Output #2

Output Measure

- Fact sheets, Bulletins and newsletters

Year	Target	Actual
2008	5	0

Output #3

Output Measure

- Short courses

Year	Target	Actual
2008	3	4

Output #4

Output Measure

- Website development and refinement

Year	Target	Actual
2008	2	3

Output #5

Output Measure

- Books and monographs

Year	Target	Actual
2008	1	0

Output #6

Output Measure

- Abstracts

Year	Target	Actual
2008	3	5

Output #7

Output Measure

- Workshops and Conferences hosted

Year	Target	Actual
2008	2	2

Output #8

Output Measure

- Public presentations

Year	Target	Actual
2008	10	29

Output #9

Output Measure

- Student training

Year	Target	Actual
2008	2	8

Output #10

Output Measure

- MS Theses and PhD Dissertations

Year	Target	Actual
2008	2	3

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 (%) forest and conservation geospatial information resources and use by towns, agencies, NGOs and the public
5	Increased understanding by wildlife biologists and managers through publications and talks of how habitat quality and forest management practices affect populations of grouse, migrating song birds, amphibians and other wildlife.
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 understanding by wildlife biologists, NGOs, local and state officials through publications and talks on people's willingness to support ecosystems and conservation.
8	Development and dissemination of new subaqueous soils interpretive approaches through publications, workshops or talks.

Outcome #1

1. **Outcome Measures**

Increased (%) GIS database usage by towns

Not reporting on this Outcome for this Annual Report

Outcome #2

1. **Outcome Measures**

Stewardship plans developed

Not reporting on this Outcome for this Annual Report

Outcome #3

1. **Outcome Measures**

Increased understanding of fish and wildlife populations (#)

Not reporting on this Outcome for this Annual Report

Outcome #4

1. **Outcome Measures**

Increased (%) forest and conservation geospatial information resources and use by towns, agencies, NGOs and the public

2. **Associated Institution Types**

- 1862 Extension
- 1862 Research

3a. **Outcome Type:**

Change in Condition Outcome Measure

3b. **Quantitative Outcome**

Year	Quantitative Target	Actual
2008	{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, there are new GIS, GPS and other remote sensing based tools that can help 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 RI. 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

Four GIS classes were taught to 37 students who earned GIS certificates of course completion. Ten workshops on GIS and GPS were given in three states in southern New England. 675 Gigabytes of geospatial data were downloaded from the geospatial data portal. RIGIS data were used to acquire and manage 2,000 acres of new properties that have been protected and stewarded by conservation agencies. Our GPS loan program made 90 loans of Garmin GPS receivers to communities, teachers, and conservation organizations.

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 or use in conservation and stewardship training programs. The 675 GB of geospatial data have fueled hundreds of geospatial analyses, 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
135	Aquatic and Terrestrial Wildlife
131	Alternative Uses of Land
123	Management and Sustainability of Forest Resources
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 forest management practices affect populations of grouse, migrating song birds, amphibians and other wildlife.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Sustaining wildlife through habitat management is a critical issue for RI. 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. Ruffed Grouse are a of particular concern in southern New England because they are a native gamebird species that is currently too rare to sustain a hunting season and they serve as a sentinel species for the response of many species to the success or failure of management of early successional forests. Although vernal ponds in forested watersheds provide essential habitat for a host of organisms, the fecundity of these organisms is highly linked to forest disturbance and management, requiring a careful understanding of the underlying ecology.

What has been done

During FY2008 we developed our research design, obtained landowner permission for access to study sites, and employed within-pond and landscape metrics to assess the impacts of urbanization at 74 seasonal ponds in Rhode Island; currently we are analyzing field and GIS data and preparing two Master's theses. We completed an 8-year project on Ruffed Grouse that culminated this FY 2008 with the completion of a spatially explicit population viability model that will be used for management. We conducted field experiments designed to determine how body condition of migrating songbirds relates to their resource use in coastal habitats.

Results

We have identified biotic and abiotic factors influencing the condition of seasonal ponds and have compared habitat characteristics and amphibian use of ponds near and distant from municipal well fields. Final products will include a rapid assessment protocol for seasonal ponds and guidelines for minimizing impacts of groundwater withdrawal on habitat suitability for pond-breeding amphibians. A spatially explicit population viability model was completed for Ruffed Grouse in Rhode Island. Fruit preferences of birds during migration were related to nutritional quality of the fruits, and naturally occurring stable isotopes of C, N, and S differed between fruits and insects commonly eaten by migratory songbirds.

4. Associated Knowledge Areas

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

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
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

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 belowground 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
136	Conservation of Biological Diversity
123	Management and Sustainability of Forest Resources
135	Aquatic and Terrestrial Wildlife

Outcome #7

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

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Economic analyses 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 IslandÂ'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
135	Aquatic and Terrestrial Wildlife
131	Alternative Uses of Land
136	Conservation of Biological Diversity

Outcome #8

1. Outcome Measures

Development and dissemination of new subaqueous soils interpretive approaches 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
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Nearly 70% of the US population lives within 50 miles of the coast. Coastal zones are heavily impacted through recreation, fishing, aquaculture, and other commercial uses. Understanding subaqueous soil resources is the key to managing coastal estuaries for any number of functions and values. Developing subaqueous 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 eelgrass restoration relationships relative to soil type. Carbon pools are being calculated from samples collected from selected mapping units of four estuaries.

Results

The experiments are fairly early in their lifespan but the preliminary data have provided some changes in knowledge. We learned that we can map out which subaqueous soil-landscape units 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 in one growing season where others do not. 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
136	Conservation of Biological Diversity
135	Aquatic and Terrestrial Wildlife
101	Appraisal of Soil Resources

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

Economic conditions may negatively affect land owners' willingness to implement stewardship plans or towns to implement urban forestry programs. Reduced funding may restrict Extension activity.

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

Program #10

V(A). Planned Program (Summary)

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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	7.0	0.0
Actual	1.8	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
144710	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
57501	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

Research investigationsfocus on watershed patterns and processes that affect the fate of nitrogen. Research methods include lab and field studies as well as geospatial analyses.

Extension programs create locally relevant programs focused on land and community management.In cooperation with stakeholders and partner agencies, we will identify needs and build upon successful local programs to create and disseminate new materials, tools and curricula in RI and New England. . Our water quality programs will continue development, delivery, training and application of proven water quality management tools and techniques such as:

Develop of curricula and training on best management practices (BMPs) for conventional and alternative and innovative onsite waste water treatment

Public outreach and training on stormwater management

Development of curricula and training regarding private wells,;

Volunteer Water Quality Monitoring

2. Brief description of the target audience

Public decision makers / Policy makers (local, state and federal agencies)

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

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	**Target**	**Target**	**Target**	**Target**
Plan	500	4500	0	0
2008	4000	123369	190	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	0	0	3

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Peer Reviewed Publications

Year	Target	Actual
2008	4	3

Output #2

Output Measure

- Fact sheets, bulletins and newsletters

Year	Target	Actual
2008	10	8

Output #3

Output Measure

- Website development and refinement

Year	Target	Actual
2008	1	8

Output #4

Output Measure

- Training manuals and Instructional CDS developed

Year	Target	Actual
2008	1	4

Output #5

Output Measure

- Public service announcements, news releases/articles

Year	Target	Actual
2008	10	15

Output #6

Output Measure

- Books and monographs

Year	Target	Actual
2008	1	0

Output #7

Output Measure

- Abstracts

Year	Target	Actual
2008	5	17

Output #8

Output Measure

- Workshops and Conferences hosted or Co-hosted

Year	Target	Actual
2008	4	50

Output #9

Output Measure

- Presentations and Short Courses

Year	Target	Actual
2008	55	83

Output #10

Output Measure

- Student training

Year	Target	Actual
2008	2	114

Output #11

Output Measure

- MS theses and PhD dissertations

Year	Target	Actual
2008	2	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	Increase in the proportion of professionals and the public knowledgeable about methods to maintain and improve onsite wastewater treatment
8	Increased (%) development and of locally based water quality data for use by communities and the public.
9	Increase in the proportion of the public and professional regarding awareness and management of storm water.
10	Increase in targeted populations of households and professionals gaining knowledge of testing, treatment and protection of well water
11	Increased understanding by scientists and decision makers through publications and presentations of the risks of watershed nitrate delivery

Outcome #1

1. **Outcome Measures**
   Increased (%) of BMP approaches adopted by target audience
   Not reporting on this Outcome for this Annual Report

Outcome #2

1. **Outcome Measures**
   Development of new models
   Not reporting on this Outcome for this Annual Report

Outcome #3

1. **Outcome Measures**
   Increased (%) adoption of onsite wastewater management plans by local communities
   Not reporting on this Outcome for this Annual Report

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 for this Annual Report

Outcome #5

1. **Outcome Measures**
   Increased adoption (%) of improved landscape management practices by targeted populations
   Not reporting on this Outcome for this Annual Report

Outcome #6

1. **Outcome Measures**
   Increased testing of well water by targeted homeowner populations
   Not reporting on this Outcome for this Annual Report

Outcome #7

1. **Outcome Measures**
   Increase in the proportion of professionals and the public knowledgeable about methods to maintain and improve onsite wastewater treatment

2. **Associated Institution Types**

   •1862 Extension
   •1862 Research

3a. **Outcome Type:**
   Change in Knowledge Outcome Measure

3b. **Quantitative Outcome**

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

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

Issue (Who cares and Why)

Onsite wastewater treatment systems serve approximately 30 percent of the Rhode Island population. Old, failed, or improperly functioning onsite wastewater 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 onsite wastewater 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 onsite wastewater 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 wastewater 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 onsite wastewater 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 wastewater 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
133	Pollution Prevention and Mitigation
112	Watershed Protection and Management

Outcome #8

1. Outcome Measures

Increased (%) development and of locally based water quality 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
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

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 analyses 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 #9

1. Outcome Measures

Increase in the proportion of the public and professional regarding awareness and management of storm water.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Stormwater pollution is a major cause of impaired water quality in Rhode Island, leading to swimming beach closures, shellfishing bans, loss of recreational value, and degraded habitat. All 39 of Rhode Island municipalities and six institutions operate small Municipal Separate Storm Sewer Systems (MS4s), and are required to comply with the EPA Phase II Storm Water Rule under the Rhode Island Pollutant Discharge Elimination System (RIPDES) permit program. These MS4s must enact storm water management programs to reduce pollutants that can enter drainage systems during storm events. This represents a significant burden for most municipalities already struggling with few staff, shrinking budgets, and in most cases, limited expertise in education and outreach.

What has been done

RI NEMO has partnered with the RI Departments of Environmental Management (RIDEM) and Transportation (RIDOT) to help municipalities meet the Storm Water Phase II Permit obligations for public education and outreach. Under this unique agreement, URI has trained MS4s in current stormwater management practices, ran a statewide media campaign to promote awareness of stormwater impacts and control actions, and developed educational materials and outreach methods for MS4s, agencies, watershed groups, and others to use or adapt locally. This cooperative effort offers the potential for far greater impact and cost effectiveness than possible with each MS4 working alone.

Results

The Statewide media campaign, known as RI Stormwater Solutions, has raised awareness about stormwater pollution through a project website (RIstormwatersolutions.org), two radio PSAs, bus kings (side of bus displays), bus shelter ads, and stand-up displays. The contacts generated are estimated conservatively at 1,214,600 for July and August, 2008. Municipalities are using educational materials in their own outreach. For example, the Town of North Kingstown worked with NEMO to customize a series of stormwater factsheets to focus on drinking water protection issues, and mailed these to residents in quarterly water bill inserts. These reached approximately 10,000 households.

4. Associated Knowledge Areas

KA Code	Knowledge Area

112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

Outcome #10

1. Outcome Measures

Increase in targeted populations of households and professionals gaining knowledge of testing, treatment and protection of well water

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

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 #11

1. Outcome Measures

Increased understanding by scientists and decision makers through publications and presentations of the risks of watershed nitrate delivery

2. Associated Institution Types

•1862 Extension
•1862 Research

3a. Outcome Type:
Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

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 denitrification. 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 denitrification 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 Ã‚Â“controlsÃ‚Â” with a woody debris block lost virtually all the nitrate-N during their incubation. Headwater streams with impoundments and woody debris might have longer retention times and more fuel for denitrification 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

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)
- During (during program)
- Time series (multiple points before and after program)
- Comparisons between program participants (individuals,group,organizations) and non-participants

Evaluation Results

Key Items of Evaluation

Program #11

V(A). Planned Program (Summary)

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	15%		15%	
205	Plant Management Systems	55%		55%	
806	Youth Development	20%		20%	
903	Communication, Education, and Information Delivery	10%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	0.0	0.0
Actual	5.3	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
129659	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
128761	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

* Conduct in-depth training in sustainable horticulture, composting, invasive management and related environmental issues (water quality protection, household stormwater management) for volunteers (train the trainer).

* Maintain strong partnership with academic and research base to provide most up-to-date, cutting edge curricula

* Strengthen partnerships with other extension programs to maximize use of volunteer trainers in getting information out to the gardening public, K-12 and community organizations and decision-makers.

* Conduct hands-on, science-based horticultural and environmental programs for K-5 children, particularly in urbanized areas of the region.

* Work in partnership with green industry to provide environmental and horticultural training to landscape maintenance and installation companies, landscape designers and garden center employees.

2. Brief description of the target audience

* Volunteers interested in learning about sustainable horticulture, composting and environmental issues and willing to volunteer time to educate others

* K- 5 youth

* horticultural organizations

* green industry

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	7000	250000	5000	0
2008	7000	250000	5000	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Peer reviewed publications

Year	Target	Actual
2008	2	0

Output #2

Output Measure

- Fact sheets, bulletins and newsletters

Year	Target	Actual
2008	10	13

Output #3

Output Measure

- Public service announcements, news releases/articles

Year	Target	Actual
2008	15	21

Output #4

Output Measure

- Website development and refinement

Year	Target	Actual
2008	2	6

Output #5

Output Measure

- Books and monographs

Year	Target	Actual
2008	1	0

Output #6

Output Measure

- Abstracts

Year	Target	Actual
2008	3	0

Output #7

Output Measure

- Workshops or Conferences hosted or co-hosted

Year	Target	Actual
2008	3	3

Output #8

Output Measure

- Presentations and short courses

Year	Target	Actual
2008	30	32

Output #9

Output Measure

- Student training

Year	Target	Actual
2008	3	3

Output #10

Output Measure

- Absolute Unique Visits to URI Master Gardener Web site

Year	Target	Actual
2008	{No Data Entered}	2778

Output #11

Output Measure

- Absolute Unique Visits to URI Outreach Center Web Site

Year	Target	Actual
2008	{No Data Entered}	6367

Output #12

Output Measure

- Volunteer Hours Donated by URI Extension Master Gardeners

Year	Target	Actual
2008	{No Data Entered}	35152

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

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 for this Annual Report

Outcome #2

1. Outcome Measures

Development of new models

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The GAP, or Good Agricultural Practices, Program is part of a voluntary food safety program developed by USDA to reduce food borne illness. Extension food safety requested to partner with Extension Master Gardener Program staff to raise awareness of food safety issues in backyard gardens in order to protect public health.

What has been done

A cadre of Extension Master Gardeners received advanced training in GAP practices. The training outlines key steps backyard food growers can take to reduce or minimize contamination of produce by disease-causing organisms.

Results

In this new model of cross-program extension partnering, 52 URI MG volunteers have increased their knowledge of food safety issues. The URI Master Gardeners have obtained GAP certification for a 5,000 square foot demonstration vegetable garden. The garden is used for public education programs which reach over 2000 people each year. GAP information is also disseminated through the media, on the web site and in public talks.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
112	Watershed Protection and Management
903	Communication, Education, and Information Delivery

Outcome #3

1. Outcome Measures

Increased (%) of BMP approaches adopted by target audiences

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	5	100

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Best management practices are used for many reasons. In the Community Garden Outreach arena, BMPs are promoted to minimize pesticide use, protect water quality, conserve water supply, promote composting and maintain biological diversity.

What has been done

Master Gardener volunteers learn about BMP in the core training and are provided additional background in advanced training programs. Master Gardeners who become active volunteers implement the BMPs in their own landscapes, work to see them implemented in their communities and share the knowledge with others.

Results

Use of BMP becomes more widespread throughout communities as Master Gardeners and other trainees incorporate them into their own landscapes. The Master Gardeners serve as models in their community and the BMP become accepted practices.

4. Associated Knowledge Areas

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

Outcome #4

1. Outcome Measures

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

Not reporting on this Outcome for this Annual Report

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)

Evaluation Results

Our pre and post surveys show that program attendees have increased knowledge and have applied the knowledge in their own practices.

Key Items of Evaluation

Program #12

V(A). Planned Program (Summary)

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: 2008	**Extension**		**Research**	
	1862	**1890**	**1862**	**1890**
Plan	0.3	0.0	1.3	0.0
Actual	0.9	0.0	1.8	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**
0	0	60337	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
53997	0	63723	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 was conducted to examine the role of selenium on and vitamin E on immune system function of lambs. Investigations also were undertaken to investigate cellular and molecular regulation of spermatogenesis and male fertility and sperm cellular functions that contribute to in vivo fertility in livestock.

2. Brief description of the target audience

The target audiences for these programs are livestock farmers in the Northeast and nationwide, the livestock artificial insemination industry and 4-H youth programs.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	100	1000	50	100
2008	100	1000	30	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	0	1	1

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Peer reviewed publications

Year	Target	Actual
2008	2	0

Output #2

Output Measure

- Student training

Year	Target	Actual
2008	2	5

Output #3

Output Measure

- Scientific and Professional Presentations

Year	Target	Actual
2008	2	3

Output #4

Output Measure

- Public presentations

Year	Target	Actual
2008	3	0

Output #5

Output Measure

- Website development and refinement

Year	Target	Actual
2008	1	0

Output #6

Output Measure

- Abstracts

Year	Target	Actual
2008	2	1

Output #7

Output Measure

- Fact sheets, bulletins and newsletters

Year	Target	Actual
2008	2	0

Output #8

Output Measure

- MS Theses and PhD Dissertations

Year	Target	Actual
2008	1	0

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 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The reproductive efficiency of livestock species is a significant contributor to the overall economic potential of the livestock industry. The fertility of livestock, especially cattle, has been declining in the past decades, and several research studies have focused on the development of a male fertility assay. There is a need for a male fertility assay that accurately predicts the inherent variation in male fertility in livestock to enhance reproductive efficiency. Our hypothesis is that assay of CREM mRNA will provide a measure of the ability of sperm to successfully fertilize ova.

What has been done

Polymerase chain reaction (PCR) was utiltized to sequence the full-length CREM messenger RNA (mRNA) in prepubertal and adult boar testis and differentiated boar sperm. Reverse transcriptase polymerase chain reaction (RT-PCR) of individual exons was first conducted using primers designed from the reported human CREM sequence. Subsequently, the 5Ã,' and 3Ã,' mRNA ends were determined using rapid amplification cDNA ends (RACE) methods. Additional PCR reactions using primers designed from boar specific sequence were conducted to identify individual repressor and activator isoforms of CREM during testis developmental stages in the bull.The cDNAs of CREM transcription factor variants will be cloned in porcine and bovine prepubertal testis, adult testis and sperm. The amount of CREM and SREBP2gc transcripts in individual sperm samples with a broad range of fertility will be investigated.

Results

Based on intial PCR amplification, we have identified that differential CREM isoforms are expressed in prepubertal and adult boar testis. This novel porcine CREM sequence has high sequence homology to the previously reported human sequence but does demonstrate species-specificity. Two different CREM isoforms are expressed in adult boar testis: CREM tau (major) and CREM tau 1 without gamma (minor). In contrast, prepubertal boar testis express at least three different CREM isoforms. With 5Ã,'RACE, we have identified alternative start exons between prepubertal and adult boar testis. Additionally, CREM isoforms with different 3Ã,'UTRs are present in prepubertal and adult boar testis and boar sperm. Ejaculated boar sperm retains adult CREM tau mRNA isoforms, but has a shorter 3Ã,'UTR region. Our results indicate the importance of identifying individual isoforms of CREM during spermatogenesis or in sperm to fully characterize CREM expression during boar spermatogenesis.

4. Associated Knowledge Areas

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

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 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The effect of vitamin E supplementation in the diets of lambs may enhance the immune response and assist in development of strategies of nutritional intervention that will ultimately improve the health and well-being of young livestock. The development of new diagnostic tools will enable us to more effectively investigate the effect of nutrient modulators on the immune system. This project continues to provide educational opportunities for our graduate and undergraduate students.

What has been done

This past year, 35 newborn lambs were assigned to one of four treatment groups which varied in the amount of vitamin E and/or selenium supplemented. Blood samples were taken every other week for analysis of antioxidant status and immune function. The effect of vitamin E supplementation on the immune response to a naturally acquired parasite infection was also evaluated.

Results

Assays for the measurement of lysozyme and IgG concentration in serum and milk samples have been successfully developed. Assays for the measurement of IgM and anti-tetanus IgG are still under development. This past year flow cytometry protocols were developed which enable us to measure phenotypic expression of T lymphocytes. These protocols will be modified in the coming year to enable measure of intracellular cytokine production in cells of the immune system. Muscle and liver biopsies were taken from study lambs for analysis of vitamin E and selenium content. The analyses of blood and tissue samples taken this past year are underway.

4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases
302	Nutrient Utilization in Animals

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Appropriations changes

Brief Explanation

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

1. Evaluation Studies Planned

- During (during program)

Evaluation Results

The programs are both active and data continue to be collected. At this time interest in the research has been expressed both by the research community and agricultural interests.

Key Items of Evaluation

Program #13

V(A). Planned Program (Summary)

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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	6.0	0.0	9.0	0.0
Actual	3.3	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
73750	0	352172	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
299792	0	267318	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 and develop species and cultivars of plants which are 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 through reduced use of herbicides and pesticides.

•Balance the costs of developing new or improved products with future benefits expected from these products.

2. Brief description of the target audience

We have active partnerships with agricultural producers of turfgrass and ornamental plants, administered by a joint advisory committee of URI, 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 the green industry 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: Rhode Island farmers are historically independent, self-sufficient operators. Given relatively low numbers of farmers within any given commodity, there are few formal commodity groups. The RI Farm Bureau acts as an umbrella for RI agriculture with national links. We have close working relationships with the green industry through the Rhode Island Nursery and Landscape Association (RINLA), which has a large annual meeting and biannual meetings of a research and outreach executive committee. 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 (e.g., start up funds for a new horticulturalist) and the development of a formal garden demonstrating sustainable plantings (see http://riaes.cels.uri.edu/explore for a virtual tour of this garden). The principle commodity groups representing turfgrass 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), although many RINLA members are also involved in turfgrass maintenance. We are working on improving relationships with these groups. We do have strong working relationships with many of the individual golf course superintendents and sod producers in the area around Kingston. Through our Winter School and GreenShare 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

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	100	1000	0	0
2008	650	5000	120	400

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	1	3	4

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Peer reviewed publications

Year	Target	Actual
2008	3	3

Output #2

Output Measure

- Books and monographs

Year	Target	Actual
2008	1	1

Output #3

Output Measure

- Abstracts

Year	Target	Actual
2008	5	4

Output #4

Output Measure

- Conference proceedings

Year	Target	Actual
2008	1	2

Output #5

Output Measure

- Technical documents, fact sheets and bulletins

Year	Target	Actual
2008	5	2

Output #6

Output Measure

- Workshops

Year	Target	Actual
2008	3	5

Output #7

Output Measure

- Website development and refinement

Year	Target	Actual
2008	1	4

Output #8

Output Measure

- Public presentations

Year	Target	Actual
2008	4	12

Output #9

Output Measure

- Student training

Year	Target	Actual
2008	5	9

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
2008	2	1

Output #11

Output Measure

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

Year	Target	Actual
2008	1	1

Output #12

Output Measure

- MS Theses and PhD Dissertations

Year	Target	Actual
2008	2	2

Output #13

Output Measure

- Professional training

Year	Target	Actual
2008	2	2

Output #14

Output Measure

- Professional/scientific presentations

Year	Target	Actual
2008	5	6

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 (%)
10	Examine interactions between the hemlock woolly adelgid and elongate hemlock scale relative to eastern hemlock growth and survival

Outcome #1

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	2	5

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Green industry growers, retailers and consumers depend on new plants to meet both practical environmental needs and to drive plant sales. Key aspects of this program include working towards a development of new plants, developing alternative shade tolerant species for Eastern Hemlock, and developing salt-tolerant native grasses for use on roadsides.

What has been done

Plants have been evaluated for introduction to the nursery and landscape industries in the northeast. More than 500 new taxa have been accessioned at the East Farm Agricultural Experiment Station and within the collections of the URI Christopher Arboretum. Adelgid-resistant germplasm of Tsuga canadensis have been collected and propagated by stem cuttings and grafting. Thirteen pine taxa have been evaluated for salt tolerance in Rhode Island coastal areas. A replicated trial of shade tolerance of Oriental Spruce was evaluated. Greenhouse trials was conducted to identify ryegrasses and fescues with significant salt tolerance.

Results

Significantly increased the availability of new landscape plants in the northeast. Worked closely with local committees to insure that new germplasm accessions did not pose a risk of invasiveness.Identified two fescue accessions which tolerated high salt levels, and were also well adapted to field conditions in New England.

4. Associated Knowledge Areas

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

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
2008	2	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The green industry seeks new and useful plant materials for production and introduction. The RI Agricultural Experiment Station serves as an important repository of germplasm and propagating material made available free of charge to regional nurseries, botanical gardens and arboreta.

What has been done

More than 15,000 woody plant propagules were distributed to cooperating nurseries and arboreta, and to the public on a limited basis. Over 8,000 mutagenized seedlings were field-planted at the Agronomy Farm at the University of Rhode Island. More than 15,000 seeds representing 13 different plant species were treated by chemical mutagenesis of open pollinated seeds. Several seedlings were selected as potential new cultivars based on unique characteristics such as leaf variegation, growth habit and unusual leaf morphology and pigmentation.

Results

RI-AES activities significantly increased the availability of new landscape plants in the northeast. Plants resulting from this program benefited the nursery industry by satisfying consumer demand for novel landscape plants.

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 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	2	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Vegetable growers in the northeastern USA and turfgrass managers in the northern USA are impacted by plant parasitic nematodes in horticultural and field crops. Information developed by this project has additional international audiences. The selection of salt-tolerant grasses benefits landscape architects and other decision makers responsible for choosing roadside grasses for use in salt-impacted areas. The secondary target is turfgrass scientists, who benefit from increased understanding of salt-tolerance mechanisms in cool-season turfgrasses.

What has been done

Screening of lettuce germplasm for resistance to Meloidogyne hapla was completed. Accessions of Lactuca sativa, L. virosa and L. serriola were inoculated with M. hapla in the greenhouse and assayed for galling after 8 weeks. Five hundred different accessions of Lactuca were screened for M. hapla resistance. Additional tissue culture work was undertaken to examine the factors influencing the tissue culturability of different Lactuca accessions utilizing multiple explant types. Chemical mutigenization of Lactuca sativa was undertaken with EMS, in an attempt to induce nematode resistance. Establishment of a bentgrass experiment to examine nematode feeding preference was undertaken in October 2007. Seven different bentgrass varieties were seeded in 5x5' blocks in a RCB design at the URI Turfgrass Research Facility.
Accessions which demonstrated superior salt tolerance in the second year of greenhouse trials were transplanted to the field for evaluation of performance under non-saline conditions. Seed was collected from those accessions which were transplanted to the field in 2007. Three ryegrass populations and four fescue populations were grown under moderate salt stress, and the roots, crowns, old leaves and young leaves were analyzed for sodium, potassium and calcium using ICP spectophotometry. Work was initiated on construction of a subtractive hybridization cDNA library using tissue from salt-stressed tolerant and susceptible accessions of fescue and ryegrass.

Results

Approximately a dozen accessions were found to have moderate to high levels of resistance in repeated trials. Most isolates of L. virosa and L. serriola ranged from moderately to completely resistant. Multiple concentrations were applied and a number of treatment produced plants with observable phenotypes. Plants were allowed to self and F1 seed are currently being screened for resistance. Plots were sampled in July of 2008, however, no significant differences were observed between varieties. At the time, plants were still relatively young and rooting was shallow. Additional sampling will continue in 2009 and 2010.
Our research has demonstrated that a low level of Meloidogyne hapla resistance does exist in Lactuca sativa accessions that may be useful in infested fields. The majority of the Meloidogyne hapla resistance in Lactuca is present in wild species which do not cross easily with Lactuca sativa, requiring novel techniques to move the resistance into commercial varieties. At least a dozen L. Sativa accessions do contain substantial M. hapla resistance, however, and could be adapted for commercial use. Bentgrass trials from the previous year suggest that some varietal sensitivity to nematodes does exist but the most recent experiment was unable to confirm this result. Additional years of testing will need to be undertaken to identify bentgrass varieties that are tolerant to soil borne plant parasitic nematodes.
In the second year of screening we were able to increase salt levels to 20,000 ppm NaCl. We identified two fescue accessions which tolerated these high salt levels; both accessions are also well adapted to field conditions in New England. Tissue analysis of tolerant and susceptible fescue and ryegrass accessions revealed that fescue relies on exclusion of salts from the actively growing leaves to survive high salt levels, while ryegrass both excludes sodium and is able to selectively take up potassium. This enables the plants to maintain the high potassium:sodium ration needed for proper growth even though the soil water is very high in sodium and low in potassium.

4. Associated Knowledge Areas

KA Code	Knowledge Area
212	Pathogens and Nematodes Affecting Plants
205	Plant Management Systems
215	Biological Control of Pests Affecting Plants
103	Management of Saline and Sodic Soils and Salinity
204	Plant Product Quality and Utility (Preharvest)
211	Insects, Mites, and Other Arthropods 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
2008	1	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Green industry growers, retailers and consumers depend on new plants to meet both practical environmental needs and to drive sales.

What has been done

we were developing a shrub breeding program with the goal of developing new landscape plants that provide aesthetic appeal and contribute to the goal of sustainable landscapes. We sought to develop novel cultivars and superior breeding germplasm through chemical mutagenesis of open pollinated seeds and in vitro plants. In vitro regeneration protocols of several ornamental plant species were being developed. Work was also underway to elucidate the molecular genetic underpinnings behind remontant flowering, which it was hoped would enhance breeding efforts and crop production methods.

Results

Over 8,000 mutagenized seedlings were field-planted at the Agronomy Farm at the University of Rhode Island. More than 15,000 seeds representing 13 different plant species were treated by chemical mutagenesis of open pollinated seeds. Several seedlings were selected as potential new cultivars based on unique characteristics such as leaf variegation, growth habit and unusual leaf morphology and pigmentation. The future of these plants is under discussion. Methods for establishing aseptic cultures of Hydrangea macrophylla, Callicarpa dichotoma and Clethra alnifolia were determined. Callus induction and root organogenesis were optimized. A collaboration was established with USDA-ARS scientists to facilitate research of remontant flowering in Hydrangea macrophylla.

4. Associated Knowledge Areas

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

Not reporting on this Outcome for this Annual Report

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
2008	2	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

This work targets growers, landscape managers, homeowners, and environmental organizations who seek environmentally responsible means of controlling pests in ornamental, food and forest crops. Golf course superintendents benefit from knowing more about pyrethroid resistance, now that it has been confirmed, and they must take steps to control weevils using other means.
We organized a survey of birch leafminer and parasitoid densities in RI, CT, MA, NY, NJ, PA, MD, and DE determining the impact of Lathrolestes nigricollis (Thompson) (Hymenoptera: Ichneumonidae) and determined that this pest is under complete biological control in all eastern states north of central NJ. We submitted a journal article on successful biological control of this pest and presented these results to the Entomological Society of America, Eastern Branch in March, 2008 and scheduled additional presentations in January and February, 2009.
Swallow-worts. We are presently holding the chrysomelids; Eumolpus asclepiadeus and Chrysolina aurichalcea, the noctuids; Abrostola asclepiadis and Hypena opulenta and the tephritid Euphranta connexa in the URI Insect Quarantine Laboratory laboratory where we are conducting studies on biology and host range of these European herbivores of swallow-wort species. Work to date indicates that E. asclepiadeus may be particularly promising for a classical biological control program. PARTICIPANTS: Regional Project Organization: Working with colleague, Bernd Blossey, from Cornell, I organized, wrote, and secured approval of this new regional project with an initiation date of February 1, 2008. There was one NE1032-sanctioned meeting during this FY: a mile-a-minute workshop organized by project member Judith Hough-Goldstein held at Longwood Gardens, PA in August. A meeting of the regional project has been scheduled during the USDA Interagency Research Forum January 13-16, 2009.

What has been done

Topical applications of bifenthrin and lambda-cyhalothrin established LD50's for 8 populations of annual bluegrass weevils in Connecticut, Massachusetts and Rhode Island. Concentrations vs. mortality regression lines were estamated to compare the LD50's and resistance ratios fro each insecticide and each population. The LD50 ranges for bifenthrin and lambda-cyhalothrin were 1.80 to 244.67 ug/insect and 0.52 to 159.53 ug/insect respectively. The field-collected strains showed low to high levels of resistance to bifenthrin (6.1 to 135.9 fold) and lambdan-cyhalothrin (28.7 to 306.8 fold). This is the first report of insecticide resistance in this species.
Metarhizium anisopliae was not effective in field trials for control of annual bluegrass weevil larvae. Results have been reported in Golf Course Management and Journal of Economic Entomology. Alternative controls are also being investigated and results will be reported in future publications.

Results

Our findings are the first science based confirmation of resistance development in annual bluegrass weevils. The extent of the resistance and how it relates to field efficacy is crucial to understanding the current control with pyrethroids and development of alternative management strategies.
Birch Leafminer: We expect substantial reduction (eventual elimination) of birch leafminer pesticide applications throughout the northeast, as well as increased aesthetic value and survival of previously-infested trees. Promising results to date, have resulted in substantial cooperation on swallow-wort biocontrol research among scientists at URI, USDA, Ag. Canada, Carlton University in Ottawa, University of Toronto, and CABI-Europe in Switzerland.

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
205	Plant Management Systems
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 (%)

Not reporting on this Outcome for this Annual Report

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)

Not reporting on this Outcome for this Annual Report

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 (%)

Not reporting on this Outcome for this Annual Report

Outcome #10

1. **Outcome Measures**

Examine interactions between the hemlock woolly adelgid and elongate hemlock scale relative to eastern hemlock growth and survival

2. **Associated Institution Types**

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Forest managers are concerned with the management of elongate hemlock scale in native hemlock forests.

What has been done

This work investigates the interaction between two invasive insects, the hemlock woolly adelgid and the elongate hemlock scale, and the consequences of this interaction for their shared host plant, eastern hemlock. This work addresses the following questions: How does the co-occurrence of HWA and EHS on eastern hemlock affect each species' density and overwintering survival? and What is the effect of HWA alone, EHS alone, and both species together on eastern hemlock growth at the branch and whole-tree level? and Do the above accord with landscape-level patterns of both insects' abundance and the health of eastern hemlock?
Field Experiment: Work at the whole-tree level under natural conditions is essential to understand the HWA-EHS interaction and its consequences for hemlock. We propose a 2x2 factorial field experiment crossing the presence or absence of each herbivore for a total of four treatments (control, HWA, EHS, HWA+EHS). We can create these treatments by applying foliage naturally infested with HWA, EHS, or neither species to uninfested hemlock saplings (~1 m in height) that have been planted in a nearby forest (mimicking the conditions in which hemlock saplings typically grow). Over a three-year period, we apply the same four treatments (HWA, EHS, both, or neither) to trees that differ in their inoculation year (2008, 2010) and length of previous colonization (populations of HWA, EHS, both, or neither species that have been present for zero or two years). The design employs an initially-unequal number of replicates per treatment to ensure that each of the nine resulting 'subtreatments' is replicated 10 times per site following the 2009 round of inoculations (10 replicate saplings/ subtreatment * 9 subtreatments/ site * 4 sites = 360 total replicate saplings). Data from these nine subtreatments can then be compared to test multiple hypotheses while controlling for random yearly variation in the performance of both insects and their shared host. To control for potential 'bag effects', we will also plant 10 saplings/site without bags; although some of these saplings will likely be colonized by HWA and/or EHS over the course of the experiment, data from the remainder can be compared with data from the bagged control trees to test for experimental artifacts. Landscape-level survey: We plan to re-survey 142 hemlock stands in summer 2009. This is a critical part of the proposal, since this data will reveal whether the landscape-level changes in insect abundance and tree health we observed in these stands during the 2005 and 2007 surveys have persisted. The findings of this survey can also be compared with the results of the field experiment to test whether the results of the experimental work are consistent with (i.e., are a potential explanation for) the observed landscape-level patterns. Experimental design and analysis: We will follow the protocol detailed in Preisser et al (in press) and resurvey each of the 142 stands in summer 2009. The survey sites are clearly marked, the sampling protocols have been shown to work well, and I anticipate that all 142 stands can again be sampled in a single summer. Once the survey is complete, we will analyze both the 2009 data itself and the change between 2005-2009 (both MA and CT) and 1997-2009 (CT only). We will use Mantel tests to assess the significance of environmental and stand variables in determining herbivore density and hemlock mortality; this technique includes space (i.e., geographic location) as a predictor variable in the analysis.

Results

Since we are only part of the way through the project, we have not yet produced a final report on our research. We have however, disseminated the preliminary results of our research by giving two posters (both with graduate students as the first author) at the 'Fourth Symposium on Hemlock Woolly Adelgid in the Eastern United States'. The citations of these posters are as follows: (1) Miller-Pierce, M., Preisser, E. and D. Orwig. 2008. Interactions between invasive herbivores: Adelges tsugae, Fiorinia externa, and their impact on eastern hemlock growth and foliar chemistry. pp. 244-245 In B. Onken and R. Reardon [eds.], Fourth Symposium on Hemlock Woolly Adelgid in the Eastern United States. US Forest Service, Hartford, CT. (2) Ingwell, L., B. Maynard, R. Casagrande, and E. Preisser. 2008. Naturally-occurring adelgid resistance in eastern hemlocks. pp. 236-237 In B. Onken and R. Reardon [eds.], Fourth Symposium on Hemlock Woolly Adelgid in the Eastern United States. US Forest Service, Hartford, CT. The work that Laura Ingwell has done can be summarized as follows: Three groups of Eastern Hemlock trees were analyzed to compare their chemical composition and the potential for naturally-occurring resistance to Hemlock Woolly Adelgid (HWA). Potentially-resistant 'parent' trees located in southern CT were compared with rooted propagules from those same trees and control trees located in northern VT (outside of the current range of HWA infestation). For trees in each of the three groups, the cations Ca, P, K, C and N were quantified and terpenoid profiles were developed using SPME and GC/MS. There was no significant variation in terpenoid profiles between the three groups of hemlock trees. Propagules retained elevated levels of Ca and N from fertilization during propagation, suggesting that their chemical composition does not mirror the parent trees. The potentially-resistant 'parent' trees had higher levels of K; this may impart some level of tolerance/resistance to HWA and explain their persistence in hemlock forests that have been decimated by HWA invasions. The work that Mailea Miller-Pierce has done can be summarized as follows: In spring 2007, we inoculated previously-uninfested hemlock foliage with one, both, or neither herbivore species. After four months, we measured the impact of each herbivore on the population density of the other species as well as their individual and combined effects on foliar chemistry. EHS densities were significantly lower in the presence of HWA; however, EHS had no impact on HWA density. In terms of foliar chemistry, we found HWA-infested foliage (in both the HWA and HWA+EHS treatments) was lower in percent nitrogen (%N) and had a higher carbon-to-nitrogen (C:N) ratio than uninfested foliage. In contrast, the EHS and control treatments did not differ in %N and C:N ratio. These findings represent the first part of a three-year study to determine the impact of these species' interactions at a landscape level over time.
PARTICIPANTS: I have trained two masters-level graduate students, Mailea Miller-Pierce and Laura Ingwell, using the funds provided by this project

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

Departure of Dr. Jeffrey Adkins from the horticulture program, without replacement. Retirement of two Research Associates, William A. Johnson and Charles Dawson, without replacement.

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

Program #14

V(A). Planned Program (Summary)

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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	2.0	0.0
Actual	0.0	0.0	2.4	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	192502	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	184602	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 programs include:
Optimized rotational management approaches for sea scallops;

Estimate the economic impact

• of salmon aquaculture on the Alaska wild salmon industry in Bristol Bay.Evaluation of the economic potential for off-shore bluefin tuna farming in the U.S. Game theoretical model of lobbying for regulatory restrictions in common resource problems,

uch as fisheries.

•

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

Target for the number of persons (contacts) reached through direct and indirect contact methods

Year	Direct Contacts Adults Target	Indirect Contacts Adults Target	Direct Contacts Youth Target	Indirect Contacts Youth Target
Plan	25	500	0	0
2008	32	700	0	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	0	2	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Peer reviewed publications

Year	Target	Actual
2008	4	2

Output #2

Output Measure

- Books and monographs

Year	Target	Actual
2008	1	0

Output #3

Output Measure

- Abstracts

Year	Target	Actual
2008	5	5

Output #4

Output Measure

- Conference proceedings

Year	Target	Actual
2008	2	2

Output #5

Output Measure

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

Year	Target	Actual
2008	3	3

Output #6

Output Measure

- Professional/scientific presentations

Year	Target	Actual
2008	5	11

Output #7

Output Measure

- Student training

Year	Target	Actual
2008	5	6

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 scientists and decision makers through publications and presentations of the outcomes of game theoretical models to identify fisheries where political intervention is likely based on the degree of heterogeneity among harvesters.
8	Increase understanding of private and public sector of economic and market factors in fisheries and aquaculture management through publications and presentations.

Outcome #1

1. **Outcome Measures**
   M.S. and Ph. D. degree conferrals (#)
   Not reporting on this Outcome for this Annual Report

Outcome #2

1. **Outcome Measures**
   Estimate the spatial decision process of fisherman within the herring industry.
   Not reporting on this Outcome for this Annual Report

Outcome #3

1. **Outcome Measures**
   Expand seafood markets by development of new marketing ideas.
   Not reporting on this Outcome for this Annual Report

Outcome #4

1. **Outcome Measures**
   Identification of market niches for seafood
   Not reporting on this Outcome for this Annual Report

Outcome #5

1. **Outcome Measures**
   Development of decision tools to integrate management and marketing of seafood.
   Not reporting on this Outcome for this Annual Report

Outcome #6

1. **Outcome Measures**
   Development of alternative seafood products.
   Not reporting on this Outcome for this Annual Report

Outcome #7

1. **Outcome Measures**
   Increase understanding of scientists and decision makers through publications and presentations of 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
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

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 are finalizing the design of an experiment to test those predictions.

Results

The theoretical results indicate that it is easier for small groups of harvesters to coordinate their lobbying actions, and thus lobby to get regulations they prefer. 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
609	Economic Theory and Methods
605	Natural Resource and Environmental Economics

Outcome #8

1. Outcome Measures

Increase understanding of private and public sector of economic and market factors in fisheries and aquaculture management through publications and presentations.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

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

Analysis was conducted of over 1500 consumers to assess consumer preferences for ecolabeled seafood products. Scallop management was evaluated using optimal control principles to define a new rotational management system for Atlantic scallops.The impact of farmed salmon on the Alaska wild salmon industry was quantified.

Results

The assessment of market benefits of ecolabeled seafood is being actively used by the entire seafood supply chain and policy makers to determine if the benefits of environmental stewardship outweigh the costs. The scallop management study has resulted in recommendation to improve current management through a rotational approach.

4. Associated Knowledge Areas

KA Code	Knowledge Area
609	Economic Theory and Methods
606	International Trade and Development
605	Natural Resource and Environmental Economics
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

Program #15

V(A). Planned Program (Summary)

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: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	2.0	0.0	2.0	0.0
Actual	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	1020051	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	290812	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 then evaluated by internal university teams and external peers. 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

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	1000	1000	0	0
2008	100	250	0	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	0	
2008	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Proposal submissions

Year	Target	Actual
2008	20	23

Output #2

Output Measure

- Proposals funded

Year	Target	Actual
2008	10	9

Output #3

Output Measure

- Requests submitted

Year	Target	Actual
2008	10	0

Output #4

Output Measure

- Requests funded

Year	Target	Actual
2008	5	0

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

{No Data Entered}

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

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
2008	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Having the appropriate infrastructure is essential for undertaking and executing modern molecular biosciences.

What has been done

Through the CELS CARES initiative, funds were expended to assist in the completion and outfitting of the University of Rhode Island's Center for Biotechnology and Life Sciences.

Results

The Center for Biotechnology and Life Sciences officially opened in January 2009.

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
2008	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Having a clear strategy to link university-based research to the end-user is essential to meet the needs of stakeholders.

What has been done

Each of the new CELS CARES projects were mandated to have an integrated component.

Results

The compelling nature of the integration of research in FY 2008 (this report) has lead us to propose soliciting a second round of integrated proposals for FY 2009.

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
2008	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Providing stakeholders with university-research based information is key to meeting the challenges and needs of stakeholders.

What has been done

Through soliciting and funding integrated proposals, we have observed that our research and extension communities are merging and collaborating on a routine and meaningful basis.

Results

The Station and Extension are better meeting the need of 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

- 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.)

Brief Explanation

{No Data Entered}

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

{No Data Entered}

Key Items of Evaluation

{No Data Entered}