

# 2013 University of Vermont Combined Research and Extension Annual Report of Accomplishments and Results

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## I. Report Overview

### 1. Executive Summary

The research and outreach results described in this report are but a short list of the ongoing work each day that has an impact on this nation. From the development of new leaders from 4-H STEM programming, to studying the response of plants to climate change, to helping adults become leaders in their communities, to addressing food safety in dairy products, to becoming Master Gardener volunteers that address local food access issues, and to enhanced grazing techniques to reduce water quality issues, all the research and outreach of the Land Grant Universities, including UVM, make continuing contributions to the strength of our individual state economies and communities.

Through the planned program efforts of the VT-AES and Extension, our work is integrated to best serve our citizens. Multidisciplinary work and integration of our research and outreach fall within and across our planned programs. For example, VT-AES food safety research on listeria in cheese is reported to Food Safety, but the results are taken by Extension to producers, where the results are reported within Global Food.

Central to our mission are public service, civic engagement and outreach throughout Vermont to further economic development, health, civic life and environmental sustainability. Each year VT-AES and Extension focus on the core areas of agriculture, environment, nutrition, food safety, health, and community and economic development. Some of our successes include the development of interagency cooperation to support farmer initiatives to keep Lake Champlain clean; patenting a new maple sap collection process to enhance future production of a valuable Vermont product, maple syrup; and UVM research and Extension outreach addressing issues surrounding climate change to include pest control strategies, crop selection, production methods and farm management strategies.

Efforts continue to evolve to address issues of importance to Vermonters as each year passes and new problems arise. Faculty and staff hires and grant funds support existing, new and expanding research and outreach efforts. For example, research on the impact of biodigester production of electricity on the farm resulted in financial data that is used in the field by Extension to help farmers weigh options regarding use of this technology. Research work on viable organic wheat production approaches has generated data on varietal type and planting dates being implemented by farmers. A phone app was refined and is part of an overall educational program to both develop and implement nutrient management plans that showed over 40% of participants implementing cover cropping and 42% reducing tillage. Combined with educational programs aimed at home gardeners that reported a 53% reduction in pesticide use due to increased use of IPM practices, the combined work at multiple levels result in changed behavior that benefits water quality. Local food is a very important state initiative and economic engine. Use of high tunnels is an increasing part of the production of local food and ongoing research in high tunnels with the saturated media extract (SME) test for soilless media, combined with newly developed organic fertilizer recommendations has resulted in a reported additional revenue stream of \$7,196 per farm. We work to improve our environment, support our food production and build economic returns.

Vermont is not just focusing on food and energy - we also concentrate on training human capital. 4-H has engaged over 2300 youths that report improved STEM knowledge and/or skills. In addition, a survey of nearly 3300 parents that participated in a divorce program (COPE) responded that they now understand that if you act in the child's best interest, they will successfully transition through the event. One parent said "....the information I got was eye opening." Another youth population consists of 5.4% of all Vermont children that live with grandparents or other relatives. Extension work to collect such data about kin care

led to a policy directive that has favorably impacted children, the kin that care for them and the social workers that support them. The AES and Extension are always challenging our faculty and our staff to address areas of interest to our various communities across the state. This challenge has made our combined efforts more relevant and focused on the needs of our communities.

Each year an annual report (<http://www.uvm.edu/extension/?Page=annualreport.php>) and event is held for our legislators. This is a popular event where selected programs of Extension and the Ag Experiment Station are highlighted and local foods such as apple pie, ice cream, cheese and sugar on snow (maple syrup on snow) are served. This is just one of several opportunities that the Directors of the VT-AES and Extension use to share the breadth of our work and also listen to evolving stakeholder needs that guide our future work.

Each year we strive to meet the expectations outlined in the reporting software and guidance offered by the Plan of Work Accountability office. Additional clarity about which professionals to include in the FTEs and the desire for limiting the reporting of FTEs within the Planned Programs to only the FTEs supported with federal dollars has been addressed. This has of course impacted the numbers, in some cases significantly in terms of reporting but it does not reflect changes with 'feet on the ground'.

**Total Actual Amount of professional FTEs/SYs for this State**

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	53.0	0.0	15.5	0.0
Actual	56.9	0.0	35.7	0.0

**II. Merit Review Process**

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

- External University Panel
- Expert Peer Review

**2. Brief Explanation**

Extension key staff have monthly telephone meetings with the four states that cooperated to develop an on-line planning and reporting system. These are an opportunity to get feedback on programs and statewide goals and initiatives. Discussions include regional programs, opportunities for multistate work, sharing staff resources and other programming strategies and issues. In addition, staff at the faculty and administrative level access the on-line system (Imprs.net) to view peers work. Program staff, faculty and administration is active in regional and national discussions around program success and challenges.

VT-AES provides the opportunity for seed project funding through a competitive proposal process. Project proposals are evaluated for scientific and technical merit through a peer review process. Projects are intended as seed funding to aid the PI in establishing a new research direction, or augment dimensions of their currently extramurally funded research program

### 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 traditional stakeholder individuals
- Targeted invitation to selected individuals from general public
- Survey of the general public
- Other (see narrative for details)

#### Brief explanation.

Many projects have a committee of advisors who provide input on the current needs. This input helps in determining the direction of program efforts including delivery method, outreach and content. Most events ask participants of programs if the programming meets their needs and expectations. Post event evaluations are standard practice for UVM Extension and provides an opportunity to gather further input informing future program effort.

A state advisory board meets with the Dean and key staff. They meet with program staff to hear more about new program efforts as well as established projects and the impact they are having. The Board serves in an advisory capacity directly to the Dean. The members represent a broad perspective with diverse experience and backgrounds.

Partnerships with communities, public and private organizations and businesses are important in reaching and serving clients with appropriate programming. These relationships remain a critical part of identifying needs and gaps for programming.

The Director of VTAES has an advisory board which meets twice a year to provide feedback and advice. They provide advice on future trends of agriculture and life sciences.

The Dean/Director of Extension and Dean of the College of Agriculture and Life Sciences, Director of VTAES meet regularly and share stakeholder input relevant to their work.

#### 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
- Use Surveys

#### Brief explanation.

Vermont has a population of under 600,000. A statistically viable sample of the public is completed each year by phone survey accessing priorities, preference for access to programs and information, and familiarity with existing program efforts. Events each year provide opportunity for feedback and direct conversations with clients and others.

VTAES Director looks at a wide range of expertise and appoints individuals in the advisory

committee who have experience in the area of dairy farming, state legislation, scientists, finance, marketing, etc..

**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
- Survey of the general public
- Meeting with invited selected individuals from the general public
- Survey of selected individuals from the general public

**Brief explanation.**

Extension completes an annual state wide population sample survey, focus groups, state advisor groups, post event and reflective data collection methods.

Individuals on the VTAES advisory board meet twice a year and provide information on future trends of agriculture and life sciences.

**3. A statement of how the input will be considered**

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

**Brief explanation.**

As a small state we know our citizens. Collected data is used to refine, remove or create new educational programs and delivery methods that will serve the needs of the state. UVM Extension has close relationship with state and local government, an asset when seeking input and when sharing expertise and/or concerns of citizens.

VTAES advisory board provides a source of council to the Director, using their input to help formulate a research direction.

**Brief Explanation of what you learned from your Stakeholders**

Increase support for local food systems research and extension.

IV. Expenditure Summary

<b>1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)</b>			
<b>Extension</b>		<b>Research</b>	
<b>Smith-Lever 3b &amp; 3c</b>	<b>1890 Extension</b>	<b>Hatch</b>	<b>Evans-Allen</b>
1652066	0	1678837	0

<b>2. Totaled Actual dollars from Planned Programs Inputs</b>				
<b>Extension</b>			<b>Research</b>	
	<b>Smith-Lever 3b &amp; 3c</b>	<b>1890 Extension</b>	<b>Hatch</b>	<b>Evans-Allen</b>
<b>Actual Formula</b>	1739391	0	2047330	0
<b>Actual Matching</b>	4203181	0	2040547	0
<b>Actual All Other</b>	5022117	0	61678	0
<b>Total Actual Expended</b>	10964689	0	4149555	0

<b>3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous</b>				
<b>Carryover</b>	126663	0	1126262	0

## V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Global Food Security and Hunger
2	Community Development and the Personal and Intellectual Development of Youth and Adults
3	Climate Change
4	Sustainable Energy
5	Childhood Obesity
6	Food Safety
7	Urban Non Point Source Pollution

**V(A). Planned Program (Summary)****Program # 1****1. Name of the Planned Program**

Global Food Security and Hunger

 Reporting on this Program**V(B). Program Knowledge Area(s)**

## 1. Program Knowledge Areas and Percentage

<b>KA Code</b>	<b>Knowledge Area</b>	<b>%1862 Extension</b>	<b>%1890 Extension</b>	<b>%1862 Research</b>	<b>%1890 Research</b>
112	Watershed Protection and Management	4%		0%	
133	Pollution Prevention and Mitigation	24%		0%	
201	Plant Genome, Genetics, and Genetic Mechanisms	0%		5%	
202	Plant Genetic Resources	0%		8%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%		10%	
205	Plant Management Systems	5%		8%	
206	Basic Plant Biology	0%		5%	
211	Insects, Mites, and Other Arthropods Affecting Plants	0%		7%	
216	Integrated Pest Management Systems	6%		1%	
302	Nutrient Utilization in Animals	0%		10%	
308	Improved Animal Products (Before Harvest)	0%		4%	
311	Animal Diseases	0%		2%	
501	New and Improved Food Processing Technologies	0%		5%	
601	Economics of Agricultural Production and Farm Management	38%		16%	
602	Business Management, Finance, and Taxation	10%		0%	
604	Marketing and Distribution Practices	3%		3%	
605	Natural Resource and Environmental Economics	4%		5%	
723	Hazards to Human Health and Safety	6%		0%	
724	Healthy Lifestyle	0%		6%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	0%		5%	
	<b>Total</b>	100%		100%	

**V(C). Planned Program (Inputs)**

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

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	31.0	0.0	5.7	0.0
Actual Paid Professional	5.0	0.0	11.5	0.0
Actual Volunteer	5.5	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
917811	0	988812	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
2217860	0	858318	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
2574519	0	25338	0

**V(D). Planned Program (Activity)****1. Brief description of the Activity**

Project listed in bold followed by delivery methods

- **Beginning Farmer Initiative.** Focus groups, learning circles, workshops, mini-courses and publications
- **Ag Business Management.** Conferences, courses, consultations and farm visits.
- **Agricultural safety.** Courses, consultations and farm visits
- **Equine program.** Annual equine event, publications, workshops.
- **Farm and Forest Transfers.** Workshops, consultations, farm visits
- **Farm Viability.** Farm visits, consultations
- **Farming Alternatives.** Workshops, consultations, farm visits.
- **Forage and Pasture Management Education.** Conference, farm visits, consultations
- **Maple Program.** Conference, workshops, newsletter.
- **Nutrient Management Program.** Farm visits, consultations
- **Organic Grain Project.** Demonstrations, data gathering.
- **Pest Management Education.** IPM and Pesticide Education and Safety Program (PESP) training.
- **Private/Commercial Landowner and Industry Professional Education:** Tour and conference
- **UVM Tax School.** conference, tax book
- **Vegetable and Berry Growers.** Consultations, farm visits, meetings, various media, presentations, website.
- **Vermont New Farmer Network.** Conference, networking, consultations
- **Vermont Pasture Network.** Pasture walks, demonstrations and trials, conference, consultations, various media.
- **Vermont Tourism and Recreation.** Research, conference.



- **Extension Master Gardener.** Course, train the trainer
  - **Women's Agricultural Network.** Newsletters, website, classes, workshops, individual and small group consultations.
  - **GAP:** Consultations, workshops
- AES efforts.**

- **Animal Manure Treatment Systems**
  - **Perturbation of soil ecosystems by anthropomorphic interventions**
  - **Soil nutrient effect on forest ecosystem productivity and lake water quality**
  - **Soil fertility/chemistry/physical problems associated with waste disposal and bioremod**
- faction**
- **Economics of organic dairy, crop management and alternative energy**
  - **Heifer nutrition, rearing and management**
  - **Dairy nutritional immunology**
  - **Small ruminant production and management systems**
  - **Development of strategies to address applied equine issues**
  - **Biofuels from energy sources**
  - **Identification of genetic traits that make species invasive**
  - **Surveillance and prevention of spread of Asian Longhorned Beetle**
  - **Management of thrips pests in forests and greenhouses**
  - **Identification/control of fungal propagation**
  - **Fungal biological plant protection, collection and management**
  - **Explore microbial pesticides and fungal components as IPM strategies**
  - **Innate immunity, DNA-based vaccines and mastitis prevention**
  - **Hormonal regulation of glucose synthesis and milk production**
  - **Functional genomics and photoperiod effects on hormonal cycles/milk production**
  - **Explore ruminant lipid metabolism**
    - **Impact of global climate**

- Understanding cheese crystals as a means to differentiate and add value to artisan cheese
- Health needs of Hispanic farmworkers
- Use of digital marketing to promote agricultural businesses

## 2. Brief description of the target audience

- 4-H: Youth
    - Adults
  - Age 25 - 60 Adult
  - Agriculture/Natural Resources: Watershed Based Organizations
  - Agriculture: Apple Growers
  - Agriculture: Beef Producers
  - Agriculture: CCA & Crop Consultants
  - Agriculture: Crop Producers
  - Agriculture: Dairy Producers
  - Agriculture: Equine Producers/Owners
  - Agriculture: Farm Employees
  - Agriculture: Farm Families
  - Agriculture: Farm Managers
  - Agriculture: Farmers
  - Agriculture: Beginning Farmers
  - Agriculture: Greenhouse Ornamental Growers
  - Agriculture: Home Gardeners
  - Agriculture: Industry Professionals
  - Agriculture: Livestock producers
  - Agriculture: Maple Industry
  - Agriculture: Maple Sugar Producers
  - Agriculture: Non-Dairy Producers
  - Agriculture: Nursery operators
  - Agriculture: Ornamentals Industry Professionals
  - Agriculture: Service Providers
  - Agriculture: Small Fruit & Vegetable Growers
  - Agriculture: Veterinarians
- 
- Communities: Educators
  - Communities: Local Officials/Leaders
  - Communities: Non-Governmental Organizations
  - Communities: Town Health Officers
  - Community leaders and citizens
  - Community: Health Entities
  - Dairy Farmers Agricultural Labor Organizations
  - Environmental Professionals: Environmental Managers
  - Extension: Advisors
  - Extension: Faculty/Staff
  - Fiddlehead Gatherers
  - Food Industry: Handlers
  - Food Industry: Processors
  - Food Industry: Producers

- Health Care Clinics serving Migrant Labor
- Home Gardeners
- Non-profit State Agricultural Agencies
- Markets offering Fiddleheads
- Ornamental Perennial Growers
- Public: Women and Minorities
- Public: Master Gardeners
- Retailers
- Service Providers in New England
- Wine Producers in New England

**3. How was eXtension used?**

Contributed to content and served on CoP leadership. Follows is a narrative from one CoP

**Issue:**

Developing a sustainable regional bioenergy supply chain suffers from a "Catch-22" - Industry is reluctant to develop without a consistent supply of bioenergy feedstocks, while crop producers must have an established and reliable market in order to produce feedstocks. USDA acknowledges the complexity of this issue and has invested \$146 Million over 5 years into 6 regional Coordinated Agricultural Projects (CAPs). Each Project will facilitate the development of a sustainable regional supply chain by integrating research, education and Extension/outreach/technology transfer.

**What has been done? - 500 characters or less**

As the national site for Extension collaborations and outreach, eXtension.org provides the logical platform to disseminate knowledge from the Bioenergy CAPs, and is encouraged by the funder. Sue Hawkins, eXtension Farm Energy Coordinator at UVM Extension, has worked with CenUSA and NEWBio Project researchers and extension educators. Resulting research-based resources and programs are produced with/under Sue's direction and published through the eXtension Farm Energy site, which provides integration with existing site materials. For an example, see CenUSA Resources.

**Results: What has changed for participants as a result of this work? - 1000 characters or less**

Two Bioenergy CAP Projects, CenUSA and NEWBio, involving 194 collaborators, 15 States, 16 Universities, 8 Federal and 8 Industry Partners are now using eXtension Farm Energy to share their collective knowledge. This includes articles, webinars, video, ask-an-expert specialists, enterprise budgets, decision making tools, etc., from these projects, which are now available to assist bioenergy stakeholders and the public to make choices and overcome obstacles to entering the bioenergy supply chain.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	24400	420000	846	300

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

Year: 2013  
 Actual: 3

**Patents listed**

.U.S. Patent #8,539,712 B2 Maple Syrup Production Assembly with Backflow Check Valve, Issued September 24, 2013  
 .U.S. Patent #8,424,242 B2 Dual-line Spout and Maple Syrup Production System Using Same, Issued April 23, 2013  
 .WO 2013/130925 A1 Sap-collecting Devices, Systems and Methods for Sap-producing Saplings, Published September 6, 2013

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2013	Extension	Research	Total
Actual	7	6	13

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Class/course

Year	Actual
2013	9

**Output #2**

**Output Measure**

- Conference

Year	Actual
2013	10

**Output #3**

**Output Measure**

- Consultation

Year	Actual
2013	3532

**Output #4**

**Output Measure**

- Consumer Publication

<b>Year</b>	<b>Actual</b>
2013	7

**Output #5**

**Output Measure**

- Demonstration

<b>Year</b>	<b>Actual</b>
2013	197

**Output #6**

**Output Measure**

- Discussion group

<b>Year</b>	<b>Actual</b>
2013	105

**Output #7**

**Output Measure**

- Educational/evaluation instrument

<b>Year</b>	<b>Actual</b>
2013	2

**Output #8**

**Output Measure**

- Electronic Communication/phone

<b>Year</b>	<b>Actual</b>
2013	236

**Output #9**

**Output Measure**

- Field day/fair

<b>Year</b>	<b>Actual</b>
2013	6

**Output #10**

**Output Measure**

- Field site visit

<b>Year</b>	<b>Actual</b>
2013	83

**Output #11**

**Output Measure**

- Funding request

<b>Year</b>	<b>Actual</b>
2013	40

**Output #12**

**Output Measure**

- Presentation

<b>Year</b>	<b>Actual</b>
2013	113

**Output #13**

**Output Measure**

- Publication - Peer Reviewed

<b>Year</b>	<b>Actual</b>
2013	7

**Output #14**

**Output Measure**

- Publication - curriculum

<b>Year</b>	<b>Actual</b>
2013	11

**Output #15**

**Output Measure**

- Publication - fact sheet

<b>Year</b>	<b>Actual</b>
2013	33

**Output #16**

**Output Measure**

- Publication - magazine article

<b>Year</b>	<b>Actual</b>
2013	13

**Output #17**

**Output Measure**

- Publication - manual

<b>Year</b>	<b>Actual</b>
2013	5

**Output #18**

**Output Measure**

- Publication - newsletter

<b>Year</b>	<b>Actual</b>
2013	63

**Output #19**

**Output Measure**

- Publication - newsprint article

<b>Year</b>	<b>Actual</b>
2013	86

**Output #20**

**Output Measure**

- Research project

<b>Year</b>	<b>Actual</b>
2013	26

**Output #21**

**Output Measure**

- TV segment/ATF

<b>Year</b>	<b>Actual</b>
2013	28

**Output #22**

**Output Measure**

- Technical Publication  
Not reporting on this Output for this Annual Report

**Output #23**

**Output Measure**

- Tour(s)

<b>Year</b>	<b>Actual</b>
2013	4

**Output #24**

**Output Measure**

- Train the Trainer trainings

<b>Year</b>	<b>Actual</b>
2013	107

**Output #25**

**Output Measure**

- Website development and updates

<b>Year</b>	<b>Actual</b>
2013	156

**Output #26**

**Output Measure**

- Workshop - series

<b>Year</b>	<b>Actual</b>
2013	11

**Output #27**

**Output Measure**

- Workshop - single session

<b>Year</b>	<b>Actual</b>
2013	164



**Output #28**

**Output Measure**

- Electronic publications

<b>Year</b>	<b>Actual</b>
2013	4

**Output #29**

**Output Measure**

- Radio

<b>Year</b>	<b>Actual</b>
2013	2

**Output #30**

**Output Measure**

- Interviews

<b>Year</b>	<b>Actual</b>
2013	11

**Output #31**

**Output Measure**

- Regular news columns

<b>Year</b>	<b>Actual</b>
2013	3

**Output #32**

**Output Measure**

- Featured article

<b>Year</b>	<b>Actual</b>
2013	2

**Output #33**

**Output Measure**

- Educational video

<b>Year</b>	<b>Actual</b>
2013	1



**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Increase and maintain collaboration on events with agency and industry personnel to address safety (farm, food, etc.) and emergency preparedness
2	number of farmers that develop a nutrient management plan protecting water and soil
3	number of Master Gardener participants earning certification
4	number of farmers who implement best field management practices(s) (crop/pasture) improving crop and/or soil productivity while protecting water, air and/or soil
5	Number of individuals who implement IPM practice(s) increasing the protection of water, air and/or soil
6	Number of individuals and business owners who implement recommended practice(s) that accomplish owner values and goals to improve/protect business sustainability
7	The number of individuals who complete a plan including preventative measures to secure animal health, food safety and public health protecting the food chain and market integrity
8	The number of growers who adopt new crop/plant variety(ies) resulting in maintaining or increasing sales
9	number of individuals who complete a business plan, start a business (within 18 months of planning) based on personal values, goals and business viability
10	number of participants who make an intentional, informed decision regarding starting a business based on feasibility, personal goals and values
11	Number passing the USDA GAPs audit to gain or maintain a market for their locally grown crop(s)
12	The number of growers growing organic crops increase revenues improving business sustainability
13	The number of producers who implement produce safety/food safety plans/practices to gain or maintain a market for their locally grown crop(s)
14	number of farmers who implement key element(s) of their nutrient management plan protecting water and soil
15	number of individuals who assess vulnerabilities and implement a practice to secure animal health, food safety, and/or public health protecting the food chain and market integrity
16	Number of individuals who implement recommended gardening practice(s) protecting water, air, and/or soil
17	Number of challenges that health care providers face as they seek to meet the needs of Vermont's migrant dairy workers.

18	Number of research results which increase the understanding of a plants response to their environment.
19	Number of studies that enhance assessment of evolutionary potential of plants to adapt to climate change.
20	Number of research results that help farmers capacity to produce high quality organic wheat.
21	Number of evaluation methods to determine the use of social media for marketing with winery producers in Vermont.
22	Number of new or improved innovations developed for safety/quality for maple producers.
23	Number of research trials to manage insect populations in greenhouse ornamentals(plants).
24	Number of research results that identifies which breeds of dairy cows that are likely to produce less methane per kilogram of fluid milk or milk solids.

**Outcome #1**

**1. Outcome Measures**

Increase and maintain collaboration on events with agency and industry personnel to address safety (farm, food, etc.) and emergency preparedness

Not Reporting on this Outcome Measure

**Outcome #2**

**1. Outcome Measures**

number of farmers that develop a nutrient management plan protecting water and soil

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2013	11

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

**Issue (Who cares and Why)**

Nutrient Management plans (NMP) are completed by farmers to protect soils and water. Record keeping is an important element to developing, implementing and updating NMP but many farmers find this a challenge. They are frequently in the field or barn where a big binder or keeping track of notes can be a problem.

**What has been done**

Noting this record keeping challenge and that most farmers carried smart phones or other devices UVM Extension developed the goCrop web and mobile app. Then a 5 week class was held for farmers to learn how to develop and document their NMP using GoCrop software. This met the NRCS 590 standard for nutrient management. Farmers attended workshops completing farm NMPs and follow up post surveys were conducted.

**Results**

Results from NMP course work indicate 43% implemented cover cropping, 42% reduced tillage, and 14% implemented new crop rotation elements of their NMPs preventing tons of soil erosion and contamination of ground and surface water. In addition the goCrop project was awarded about \$400,000 from USDA this spring to expand the app for use around the Northeast and California, where soil conditions are different, and add functions for mapping, grazing and pest management. This technology will support farmers in their efforts to keep accurate records to implement and maintain their NMPs protecting our natural resources.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
133	Pollution Prevention and Mitigation

**Outcome #3**

**1. Outcome Measures**

number of Master Gardener participants earning certification

Not Reporting on this Outcome Measure

**Outcome #4**

**1. Outcome Measures**

number of farmers who implement best field management practices(s) (crop/pasture) improving crop and/or soil productivity while protecting water, air and/or soil

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2013	158

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

**Issue (Who cares and Why)**

Water quality degradation is problematic in Lake Champlain. Often this is the result of erosion and runoff of nutrients from agricultural soils. Soils left without growing plants are often at higher risk for erosion, many of these fields are fall harvested corn fields or are on heavy clay, in flood plains and are highly erodible. Another issue is direct access to streams by livestock. Methods are available which reduce erosion and contaminants entering water but time appropriate tools, and experience can be barriers.

**What has been done**

UVM proposed aerial seeding of cover crops prior to harvest allowing cover crops to establish earlier and to address the time element for farmers. No-till grain drills benefit some fields with decreased soil erosion, phosphorus runoff, increased soil organic matter and reduced fuel costs. Two no-till drills were outfitted with a GPS monitor and receiver were offered, transported and demonstrated to farmers. Livestock exclusion projects were also offered with financial support. Field demonstrations, factsheets, newsletters, Youtube and other educational outreach were completed during the year.

**Results**

Though cover cropping has become more popular over the last 5 years with acreage increasing from 500 acres in 2007 to 6000 acres in 2011, in 2012 over 2000 acres of land that would have been bare were aerial seeded and had ground cover heading into winter. In 2012 farmers retrofitted planters to no-till with GPS and thousands of acres were planted without plowing preventing an average soil loss from erosion at 2 tons per acre. Over 27,000 linear feet of stream bank were protected with exclusion projects. With over 150 farmers implementing these practices tons of contaminants have been prevented from impairing our waters.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
133	Pollution Prevention and Mitigation
601	Economics of Agricultural Production and Farm Management

## **Outcome #5**

### **1. Outcome Measures**

Number of individuals who implement IPM practice(s) increasing the protection of water, air and/or soil

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	99

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

#### **Issue (Who cares and Why)**

Home gardeners want to garden more economically and are sensitive to contaminants to their food and natural environment. With a double digit increase in the percent of households growing their own edible plants within the past 5 years, home gardeners need and desire information on these topics. Greenhouse growers and garden supply owners want the latest information to be responsive to home gardeners and are themselves interested in using best practices to reduce costs and protect the environment.

#### **What has been done**

The annual Vermont Flower Show offers home gardeners talks on a variety of topics with standing room only at many sessions. Greenhouse growers and garden retailers meet annually and access Extension expertise with on-line resources and consultations. In 2012 an estimated 562 unique individuals attended educational sessions at the 2013 Show, attending an average of 4.3 sessions. A majority, 83%, of the participants have been to previous conferences consistent with the 3 year average of 85%. The series of 26 sessions is done by local, regional and national experts. A biennial Northeast Greenhouse conference was held in Massachusetts, its 40th year with approximately 1100 attendees this year also with educational sessions. Participants are asked if they have attended previously, if so did they implement something they learned.

#### **Results**

Sixty-six percent of the attending home gardeners report using more environmentally friendly practices. This year 53% reported using less pesticides and more IPM, and 62% purchased new or appropriate plants. A separate market survey found on average they each spent \$300 per year on gardening. Previous greenhouse conference attendees reported 74% made changes in pest management practices such as using biologicals, 38% incorporated more sustainable production practices and 31% realized energy savings and improved marketing. Cost savings for industry

keeps down costs passed on to home gardeners and viable businesses. Both industry and home gardeners are using IPM practices. Judicious use of chemicals and pesticides minimizing the negative impacts to people, animals, and the environment.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
133	Pollution Prevention and Mitigation
216	Integrated Pest Management Systems
723	Hazards to Human Health and Safety

#### Outcome #6

##### 1. Outcome Measures

Number of individuals and business owners who implement recommended practice(s) that accomplish owner values and goals to improve/protect business sustainability

##### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

##### 3a. Outcome Type:

Change in Action Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2013	860

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

###### **Issue (Who cares and Why)**

Strong demand for fresh local food is booming in the region and that is reflected in the growth of greenhouse and high tunnel (unheated greenhouse) vegetable production in Vermont. The 2007 Census of Agriculture notes that Vermont produced in 425,083 sq ft. of greenhouse totaling \$3.95 million in sales. Since then, production has more than doubled evidenced by USDA NRCS-VT funding for 209 new high tunnels on vegetable farms from 2010-12. Managing crop nutrition in this situation is challenging. Typical soil tests do not meet their needs.

###### **What has been done**

The saturated media extract (SME) test has been used to test soilless potting mixes to grow bedding plants and flowers and is described as a soil test for in-ground greenhouse tomatoes. UVM Extension compared traditional soil test and SME results from the same greenhouse soils, refined the Michigan greenhouse tomato nutrient recommendations based on SME and adapted them from conventional fertilizers to organically- allowed fertilizers. This new information was presented at conferences, on-line fact sheets and at a regional research symposium.



**Results**

Since 2007, approximately 300 greenhouse soil samples have been submitted to labs, then forwarded to UVM Extension for interpretation and recommendations. A December 2012 anonymous survey of 50 growers, 43 who responded had 179 greenhouses and tunnels with 569,330 sq. ft. of growing area producing \$1.99 million in annual sales. 98% said they followed the recommendations with 21 of the 43 responding giving a estimated value of the recommendations on their greenhouse crop production. The 21 estimated \$166,250 or \$7,197 per farm in additional revenue. Extrapolating this to the 43 respondents would total over \$1.2 million. A significant boost to these farms viability and importantly a significant increase in public access to local fresh food.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
205	Plant Management Systems
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
605	Natural Resource and Environmental Economics
723	Hazards to Human Health and Safety

**Outcome #7**

**1. Outcome Measures**

The number of individuals who complete a plan including preventative measures to secure animal health, food safety and public health protecting the food chain and market integrity

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	39

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

**Issue (Who cares and Why)**

Vermont controls approximately 35% of all U.S. maple syrup production or distribution.<sup>1</sup> The maple industry is not only an important contributor economically, about \$40 million each year, but also for its contribution to the Vermont landscape, important to Vermont's tourism industry. Protecting the Vermont brand and public health, buyers and resellers of bulk Vermont syrup asked for a regulatory program. <sup>1</sup> Maple Syrup UVM Libraries [library.uvm.edu/maple/faq/](http://library.uvm.edu/maple/faq/)

### **What has been done**

A voluntary certification program for Sugarmakers was developed with input from industry leaders, food safety specialists and others in the maple industry. A letter explaining the voluntary program was shared with 700 Sugarmakers. At the Vermont maple conferences, held around the state, 2-1 hour long sessions for producers were held explaining the certification guidelines. While we considered this might be a 'bitter pill' and of interest to the only the largest producers, many producers under the 2000 tap number attended.

### **Results**

Eighty percent of those attending the sessions, over 230 producers, rated this session as the "most informative and useful" session of the day supported with comments like, "I'm glad we sugarmakers are on top of this; certification is coming -good to get ahead of the curve." The person in charge of the inspection team currently accrediting the Vermont maple operations said, "One of the things that is very evident is that producers attended the maple conference and listened to the presentation on the certification guidelines. Most have taken the information that you provided and upgraded their operations...some small producers that, while they may not sign up for certification, have taken advice given and made changes regarding food safety. I think this is a big win for the Vermont maple industry."

### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
604	Marketing and Distribution Practices
723	Hazards to Human Health and Safety

### **Outcome #8**

#### **1. Outcome Measures**

The number of growers who adopt new crop/plant variety(ies) resulting in maintaining or increasing sales

Not Reporting on this Outcome Measure

### **Outcome #9**

#### **1. Outcome Measures**

number of individuals who complete a business plan, start a business (within 18 months of planning) based on personal values, goals and business viability

#### **2. Associated Institution Types**

- 1862 Extension

#### **3a. Outcome Type:**

Change in Action Outcome Measure

### 3b. Quantitative Outcome

Year	Actual
2013	4

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Half of Vermont's 6900 farms have at least one woman operator. The most recent USDA Census of Ag shows the number of female principal operators in Vermont increased from 967 to 1466 in five years. Data shows that women tend to have smaller farms, to farm using sustainable practices with the goal of producing safe, healthy food. As a growing segment of the farming population, they will be looked to to maintain Vermont's productive landscape and to provide access to local, healthy food. They will need a strong network, education and technical assistance.

#### What has been done

For the last four years VT Women's Ag Network (VT WAgN) and the VT New Farmer Project (VT NEP) of UVM Extension partnered with Holistic Management International to offer a unique curriculum in Whole Farm Planning funded by USDA Beginning Farmer and Rancher Development grant. Each year since 2010 a class of 15 attended a 10 day-long session on holistic farm management with one farmer receiving training to become a certified educator in Holistic management.

#### Results

Of the 60 participants 46, 76.6% are still managing farm businesses. This success rate deviates from the expectation that over 56% will fail after 4 years. Others made the decision not to farm or pursued other careers. Recognizing the contribution of women and the challenges they bring to agricultural careers has grown the ag sector in Vermont creating jobs, economic stimulus to communities and access to local, healthy food. This group of farmers is critical to Vermont's long term agricultural economy.

### 4. Associated Knowledge Areas

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

### Outcome #10

#### 1. Outcome Measures

number of participants who make an intentional, informed decision regarding starting a business based on feasibility, personal goals and values

#### 2. Associated Institution Types

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	3

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

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
601	Economics of Agricultural Production and Farm Management

**Outcome #11**

**1. Outcome Measures**

Number passing the USDA GAPs audit to gain or maintain a market for their locally grown crop(s)

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	35

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

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
601	Economics of Agricultural Production and Farm Management
723	Hazards to Human Health and Safety

**Outcome #12**

**1. Outcome Measures**

The number of growers growing organic crops increase revenues improving business sustainability

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	91

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

**Issue (Who cares and Why)**

The local food movement has increased the demand on farmers to produce new crops such as cereal grains for human consumption and hops for the brewing industry. These crops have not been grown in Vermont for many decades so there is little to no information. Farmers were demanding information on how to best grow and harvest an economically viable product on their farm to have the opportunity to grow a high value crop, important to their farms viability.

**What has been done**

Resources were developed and made accessible in various formats. Research sites, consultations, field days, and conferences were held. Wiki's (working model and designs) were posted for a hops harvester, drier (oast), and a mechanical and hand operated baler. From June 2011 - August 2012 information was delivered to 708 farmers and service providers on grain production and 645 on hop production. The mobile hops harvester is used by multiple farms allowing timely harvest for small producers. 100 growers were surveyed to determine impact on their farms.

**Results**

Survey results for grain growers reflect 68% have improved networking; 29% have increased their grain acreage; 29% have improved markets and processing infrastructure. At least 3 brewers, 2 distillers, and 2 maltsters are now purchasing local grains. Hops results reflect 95% were helped to start or expand their hopyard; 68% used our research to improve yields; 100% stated the research helped them improve hop quality; 60% reported the project helped them find markets. As a direct result of the UVM networking events, 13 local breweries are now purchasing hops from Vermont growers. In 2012, 91 farms report as a result of growing grains or hops they have improved the viability of their farms, protecting businesses in Vermont communities.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
601	Economics of Agricultural Production and Farm Management
604	Marketing and Distribution Practices

**Outcome #13**

**1. Outcome Measures**

The number of producers who implement produce safety/food safety plans/practices to gain or maintain a market for their locally grown crop(s)

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	23

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

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
604	Marketing and Distribution Practices

723 Hazards to Human Health and Safety

**Outcome #14**

**1. Outcome Measures**

number of farmers who implement key element(s) of their nutrient management plan protecting water and soil

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2013	24

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

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

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

**Outcome #15**

**1. Outcome Measures**

number of individuals who assess vulnerabilities and implement a practice to secure animal health, food safety, and/or public health protecting the food chain and market integrity

Not Reporting on this Outcome Measure

**Outcome #16**

**1. Outcome Measures**

Number of individuals who implement recommended gardening practice(s) protecting water, air, and/or soil

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	32

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

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
205	Plant Management Systems
216	Integrated Pest Management Systems

**Outcome #17**

**1. Outcome Measures**

Number of challenges that health care providers face as they seek to meet the needs of Vermont's migrant dairy workers.

**2. Associated Institution Types**

- 1862 Research



**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2013	5

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

**Issue (Who cares and Why)**

In the past ten years Hispanic workers have arrived in Vermont and have become a significant portion of the Vermont dairy labor force. In 2007 the Vermont Department of Health studied the health status and found a number of problems; primary care for childhood was inconsistent, for some there were no vaccinations, workers were not screened for tuberculosis, limited dental care, skin problems, and pain and injuries related to work.

**What has been done**

Research includes an assessment of the challenges rural health care providers face with this new foreign population.

**Results**

Information in this research will be used in law enforcement, outreach to farmers, public opinion, supported environments, and policy development.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
803	Sociological and Technological Change Affecting Individuals, Families, and Communities

**Outcome #18**

**1. Outcome Measures**

Number of research results which increase the understanding of a plants response to their environment.

**2. Associated Institution Types**

- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

### 3b. Quantitative Outcome

Year	Actual
2013	1

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Plants are rooted to one spot their entire life. In order to survive, plants must sense even the smallest environmental change and respond rapidly, changing their physiology and modifying further development.

#### What has been done

Plants produce reactive oxygen species (ROS) in response to environmental stress. The research lies with understanding how plants respond to environmental stress by understanding how ROS is regulated. The research tests the GIRAFFE gene involved in ROS in the plants roots to see if plants have abnormal levels of ROS.

#### Results

The research has found that the GIRAFFE gene alters the expression of certain enzymes that are required for oxidative stress on plants. Understanding the rapid molecular changes that underlie plant's responses to the environment can help optimize conditions or treatments that maximize plant yields under stressful conditions.

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
201	Plant Genome, Genetics, and Genetic Mechanisms
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
206	Basic Plant Biology

### Outcome #19

#### 1. Outcome Measures

Number of studies that enhance assessment of evolutionary potential of plants to adapt to climate change.

#### 2. Associated Institution Types

- 1862 Research

#### 3a. Outcome Type:

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2013	4

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

**Issue (Who cares and Why)**

The understanding of how climate change affects plants development will enable agricultural farmers and researchers to better understand how to improve crops.

**What has been done**

The studies that were performed; phylogenetic, geo-climatic, gene expression and functional tools. With these studies, the researcher is determining the genetic basis for losses of vernalization responsiveness and assessing the evolutionary potential of plants to adapt to climate change.

**Results**

Vernalization responsiveness plants are winter cold and are accustomed to harsh temperatures. It was determined that extended period of cold makes plants able to respond to long days and warm temperatures.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
201	Plant Genome, Genetics, and Genetic Mechanisms
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
206	Basic Plant Biology

**Outcome #20**

**1. Outcome Measures**

Number of research results that help farmers capacity to produce high quality organic wheat.

**2. Associated Institution Types**

- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2013	1

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Demand for local organic food continues to rise throughout Vermont and the Northeast.

#### What has been done

Develop viable organic bread wheat production strategies by addressing production constraints, determine the impact of spring wheat cultivar selection and planting date on weed biomass, determine the impact of winter wheat cultivar selection and harvest timing on grain yields and end-use quality.

#### Results

The researcher has determined that mid to late April planting dates produced significantly higher yields compared to mid to end of May planting dates. Varieties with taller stature competed better with weeds. Weed biomass was significantly higher as planting dates became later. Taller varieties should be planted later. Highest yields were obtained at wheat physiological maturity (30% moisture).

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

### Outcome #21

#### 1. Outcome Measures

Number of evaluation methods to determine the use of social media for marketing with winery producers in Vermont.

#### 2. Associated Institution Types

- 1862 Research

#### 3a. Outcome Type:

Change in Knowledge Outcome Measure

#### 3b. Quantitative Outcome

Year	Actual
2013	2

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Wineries are an important and growing sector of the Vermont agricultural economy, and yet little systematic information exists about the sector and the effectiveness of promotional strategies used by farmers to attract customers and tourists.

**What has been done**

A survey/interview with winery owners in Vermont to collect information regarding demographics and characteristics of farm and farm operators, such as farm size and farm operations.

**Results**

Evaluation methods were developed to assess network impacts on promotional strategies for winery producers in the Northeast region. The first one was a scale-level ranking system to evaluate social media applications and effectiveness for various public supported websites and the second was a survey instrument to collect winery producers perceptions of using social media to promote wines. Research will help farmers to maintain existing market shares while also expanding into new business areas, even as they face growing challenges from global competition.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices

**Outcome #22**

**1. Outcome Measures**

Number of new or improved innovations developed for safety/quality for maple producers.

**2. Associated Institution Types**

- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	3

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

**Issue (Who cares and Why)**

Vermont maple producers face increasing challenges to maintain economically sustainable operations. Rising fuel prices and costs to implement the practices to meet the demands for heightened assurance of product safety and quality have increased.

**What has been done**

The project will be accomplished in two phases. Currently the project is in phase one. Phase one will focus on establishing whether a sufficient quantity of sugar can be extracted annually using alternative systems of maple crop management. If found to be sufficient, Phase II will take place in Years 4 and 5, and will determine the optimum alternative system and develop and optimize techniques and equipment for this system.

**Results**

The result is an estimation of the quantity of sugar that can be extracted repeatedly using the alternative systems of maple crop management, and to accommodate for year-to-year variation in sapflow conditions. It is important to maple production operations to develop ecologically sustainable mechanism to increase the productivity and enable producers to continue to thrive and provide affordable high quality product to consumers.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
205	Plant Management Systems
206	Basic Plant Biology

**Outcome #23**

**1. Outcome Measures**

Number of research trials to manage insect populations in greenhouse ornamentals(plants).

**2. Associated Institution Types**

- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	1

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

**Issue (Who cares and Why)**

The greenhouse industry is a vital and dynamic component of New England's changing agricultural economy. Pest control strategies are heavily reliant on chemical pesticides, a situation that is neither sustainable nor desirable, and novel approaches that increase opportunities to utilize biological controls are badly needed. This project seeks to generate information and novel technologies that will provide growers with the tools they need to increase their use of natural enemies, and enhance the activity of biological and reduced-risk pesticides.

**What has been done**

Marigolds are highly attractive to thrips and can be used for early detection and because they produce pollen can serve as habitat for mites by providing an alternative food source. The goal of the experiment is to see what plants attract mites and thrips.

### Results

The results were found that in all locations there was more damage on the marigolds than on the crops. On many occasions, marigolds had ratings exceeding 50% foliar damage whereas nearby crop plants had less than 10 percent damage. When averaged over the entire experimental period, in general, more thrips were found on marigolds with not mites or fungal treatment than on those treated with mites and/or fungi. Two of the five sites had very low overall numbers of thrips making it difficult to make conclusions on treatment efficacy. Thrip numbers increased rapidly on some of the marigolds without the fungal or mite treatments and had to be removed 2-4 weeks before the end of the experiment to avoid reinfesting the crop. On these plants foliar damage of over 75 percent was observed. No significant differences in the number of thrips on marigolds with or without the lures.

## 4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
216	Integrated Pest Management Systems

## Outcome #24

### 1. Outcome Measures

Number of research results that identifies which breeds of dairy cows that are likely to produce less methane per kilogram of fluid milk or milk solids.

### 2. Associated Institution Types

- 1862 Research

### 3a. Outcome Type:

Change in Knowledge Outcome Measure

### 3b. Quantitative Outcome

Year	Actual
2013	1

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Methane production is of concern for its waste of feed energy for the cow as well as its contribution to the accumulation of greenhouse gases. As methane is exhaled into the atmosphere, the cow suffers a loss of ingested feed-derived energy. The dairy and beef industries are continually challenged to adopt mitigation strategies that reduce production of

greenhouse gases while incorporating best husbandry practices.

**What has been done**

Five lactating dairy cows from each breed; Holstein, Jerseys, HolstenXJersey crosses were studied.

**Results**

Holstein and Jersey breeds account for the vast majority of animals used in the dairy cattle industry within the US. Holstein cow is on the average larger and produces greater amounts of milk, while a Jersey cow has better fertility, produces milk with higher solids content, is better at maintaining its body condition during lactation, and has a greater feed efficiency, which is known to result in lower methane production.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
302	Nutrient Utilization in Animals

**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)**

**Evaluation Results**

Post event evaluation's via survey and on-site visits are standard practice of faculty and staff assessing if the expected outcomes are realized. Additional efforts such as a survey on bedded pack technology was done with the goal of establishing a one-day workshop to instruct new and existing farmers into a properly managed bedded pack.

Other strategies use annual events to ask attendees if they attended the previous year(s) and if and what they implemented as a result of the information gained.

**Key Items of Evaluation**



**V(A). Planned Program (Summary)**

**Program # 2**

**1. Name of the Planned Program**

Community Development and the Personal and Intellectual Development of Youth and Adults

Reporting on this Program

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
124	Urban Forestry	8%		0%	
608	Community Resource Planning and Development	15%		0%	
802	Human Development and Family Well-Being	10%		0%	
805	Community Institutions, Health, and Social Services	7%		0%	
806	Youth Development	60%		0%	
	<b>Total</b>	100%		0%	

**V(C). Planned Program (Inputs)**

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	26.3	0.0	0.0	0.0
Actual Paid Professional	2.9	0.0	0.0	0.0
Actual Volunteer	13.0	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
758453	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1832776	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
2127850	0	0	0

## **V(D). Planned Program (Activity)**

### **1. Brief description of the Activity**

•4-H Positive Youth Development Program: Help youth acquire Life Skills in the following areas: Decision Making; Critical Thinking; Problem-Solving; Communication; Goal-Setting; and Skills for Everyday Living to succeed as adults. Delivery Methods: 6-8 sequential learning hours using experiential learning techniques for in- school, afterschool, or out-of-school settings

•Operation Military Kids (OMK) exists to educate Vermont communities on the unique experiences and challenges of military life and its impact on families, while providing positive opportunities for youth. Ready, Set, Go! Operation: Military Kids Vermont OMK-VT aims to establish community partnerships that will connect and educate people by: Creating community support, delivering opportunities to youth and families, supporting military kids, collaborating with community partners, educating the public, including the education community, and incorporating military families into existing community resources.

•S.E.T. Activities: 4-H SET will begin to show how science and engineering issues affect youths' lives and prepare a future generation of scientists and engineers. The 4-H SET program will present 4-H with a new opportunity to connect to the LGU's SET research community and integrate with current youth workforce development initiatives.

•Market Analysis, Needs Assessment and Strategic Planning: This program provides the community with analytical techniques that can be put to work immediately in economic revitalization efforts. The process requires input from local residents so that recommendations reflect both market conditions as well as the preferences of the community. Delivery Methods: Group meetings and discussion groups in community.

•Community Leadership: Assessing, addressing and expanding community capacity through leadership and public policy education efforts including building--and education members and clientele of--coalitions and collaboratives.

•Coping with Separation and Divorce (COPE): Parent education for parents of minor children who have filed for separation, divorce, dissolving of a civil union, parentage, changes in rights and responsibilities concerning their children. This is a court mandated program.

•Migrant Education Recruitment Program (MEP): To ensure that children of migrant farm workers, and qualifying youth under age 22, are aware of the educational support services available to them. Delivery Methods: Outreach to schools, agricultural employers, and social service agencies throughout the state.

•Vermont AgrAbility Project: To make recommendations that can be used by farmers with disabilities to maintain employment, through development of accommodations. Delivery Methods: Process involves recruitment of eligible individuals through referrals. Intake information is recorded on farms provided by the National AgrAbility Project. Site visits are the primary means of contact.

•Take Charge (TC/RC): Helping community adult members to gain the skills necessary to be

confident enough to take part in town government by ultimately competing for town government leadership positions. Delivery Methods: Meetings, discussion groups.

•Town Officers Education Conference & Municipal Officers Management (TOEC/MOMS): Local town officers, decisionmakers and officials receive education and tools to improve job performance and management, addressing topics from new legislation to handling difficult customers. Delivery methods: Each one-day conference is held annually, at multiple sites.

•Vermont Urban and Community Forestry program :A joint initiative between the University of Vermont Extension and the Department of Forests, Parks and Recreation. The mission of the program is to promote the stewardship of the urban and rural landscapes to enhance the quality of life in Vermont communities. The program provides educational, technical and financial assistance in the management of trees and forests, in and around the built landscape. Delivery Methods: Classes, meetings, various media, community volunteer projects.

•Foster, Adoptive and Kin Care Partnership: Enhance outcomes for children in foster, adoptive and kin care homes. Delivery Methods: Curriculum and workshop series

PROSPER:[**PRO**moting **S**chool-community-university**P**artnerships to **E**nhance **R**esilience]: PROSPER is a delivery system of evidence-based programs for the purpose of improved Child and Family Outcomes such as long-term reductions in substance use; reduced youth behavior problems; and long-term effects on school engagement and academic success, with similar benefits occurring for both low- and high-risk groups.

## 2. Brief description of the target audience

- 4-H Leaders (Adult)
- 4-H: Adult Volunteers
- 4-H: Camp Board Directors
- 4-H: Youth Volunteers
- Adults
- Agriculture: Farm Families
- Agriculture: Farmers
- Agriculture: Farmers w/disabilities
- Agriculture: Industry Professionals
- Agriculture: Livestock producers
- Agriculture:Government Agency Personnel
- Communities: Cities and Towns
- Communities: Educators
- Communities: Local Officials/Leaders
- Communities: Non-Governmental Organizations
- Communities: Schools
- Community leaders and citizens
- Extension: Faculty/Staff
- Forestry: Landscape Industry
- Forestry: Woodland Managers/Foresters
- Funders
- Policy Makers: Legislators
- Public: Families

- Public: General
- Public: Nonprofit Organizations
- Public: Parents
- Public: Small Business Owners/Entrepreneurs
- Train-the-Trainer recipients:adults
- USDA personnel
- 4-H: Youth
- Migrant In School Youth
- Migrant Out of School Youth
- School Enrichment Program Participants (Youth)

**3. How was eXtension used?**

contributor of materials to CoP

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	10447	16800	9996	1600

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

**Patent Applications Submitted**

Year: 2013  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2013	Extension	Research	Total
<b>Actual</b>	1	0	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- 4-H Afterschool  
 Not reporting on this Output for this Annual Report

**Output #2**

**Output Measure**

- 4-H Club

<b>Year</b>	<b>Actual</b>
2013	209

**Output #3**

**Output Measure**

- 4-H Day Camp

<b>Year</b>	<b>Actual</b>
2013	15

**Output #4**

**Output Measure**

- 4-H Overnight camp

<b>Year</b>	<b>Actual</b>
2013	8

**Output #5**

**Output Measure**

- 4-H School enrichment

<b>Year</b>	<b>Actual</b>
2013	78

**Output #6**

**Output Measure**

- 4-H Short-term/special interest

<b>Year</b>	<b>Actual</b>
2013	179

**Output #7**

**Output Measure**

- Class/course

<b>Year</b>	<b>Actual</b>
2013	50

**Output #8**

**Output Measure**

- Conference

<b>Year</b>	<b>Actual</b>
2013	4

**Output #9**

**Output Measure**

- Consultations

<b>Year</b>	<b>Actual</b>
2013	273

**Output #10**

**Output Measure**

- Discussion group

<b>Year</b>	<b>Actual</b>
2013	187

**Output #11**

**Output Measure**

- Field site visit

<b>Year</b>	<b>Actual</b>
2013	572

**Output #12**

**Output Measure**

- Funding request  
Not reporting on this Output for this Annual Report

**Output #13**

**Output Measure**

- Presentations

<b>Year</b>	<b>Actual</b>
2013	33

**Output #14**

**Output Measure**

- Publication - fact sheet

<b>Year</b>	<b>Actual</b>
2013	1

**Output #15**

**Output Measure**

- Publication - newsletter

<b>Year</b>	<b>Actual</b>
2013	118

**Output #16**

**Output Measure**

- Publication - newsprint article

<b>Year</b>	<b>Actual</b>
2013	3

**Output #17**

**Output Measure**

- Radio Spots/program (educational  
Not reporting on this Output for this Annual Report

**Output #18**

**Output Measure**

- TV segment/ATF

<b>Year</b>	<b>Actual</b>
2013	12

**Output #19**

**Output Measure**

- Train the Trainer sessions  
Not reporting on this Output for this Annual Report

**Output #20**

**Output Measure**

- Web Page

<b>Year</b>	<b>Actual</b>
2013	24

**Output #21**

**Output Measure**

- Workshop - series

<b>Year</b>	<b>Actual</b>
2013	34

**Output #22**

**Output Measure**

- Workshop - single session  
Not reporting on this Output for this Annual Report

**Output #23**

**Output Measure**

- Trainee delivered programming

<b>Year</b>	<b>Actual</b>
2013	101

**Output #24**

**Output Measure**

- Electronic Communication/phone  
Not reporting on this Output for this Annual Report



**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	increase in number of farm and rural residents with disabilities successfully served (ie case is closed) which is defined as having increased satisfaction with actual or potential employment and maintained or increased income
2	Number of Migrant Education eligible students enrolled
3	Increase the number of program participants serving as leaders on Committees
4	Number of individuals (youth and volunteers) increasing knowledge and/or skills in content and careers (across subject areas ranging from animal science to environmental science to technology)
5	Number of individuals who use leadership and decision making skills in executing their role and responsibilities effectively developing and/or implementing policy
6	Increase the number of parents understanding family transition through parentage, divorce or separation who understand the impact of these changes on their children.
7	Number of farmers with disabilities maintaining employment
8	increase in number of youth reached with positive youth development programming demonstrate mastery for targeted life skills, including: Decision making; wise use of resources; communication; accepting differences; leadership; useful/marketable skills; healthy lifestyle choices; and/or self-responsibility
9	Number of volunteers and staff demonstrating new techniques/activities in clubs and programs learned through 4-H training and developmemnt
10	the number or new and maintained collaborations on events with agency and industry personnel to address safety (farm, food, etc.) and emergency preparedness
11	the number of published policy changes addressing best practices in child welfare.
12	Number of individuals who use skills and effectively participate in addressing community issue(s) (e.g. green infrastructure, local leadership, hunger, volunteerism, etc.)
13	Number of participants who are English language learners will increase their level of English proficiency
14	Number of participants who report improvements in children's self-regulation and attachment related behaviors
15	number of individuals who assess vulnerabilities and implement a practice to secure animal health, food safety, and/or public health protecting the food chain and market integrity
16	The number of communities or community group/organization(s) establishing or expanding projects to improve or mitigate a community issue

**Outcome #1**

**1. Outcome Measures**

increase in number of farm and rural residents with disabilities successfully served (ie case is closed) which is defined as having increased satisfaction with actual or potential employment and maintained or increased income

Not Reporting on this Outcome Measure

**Outcome #2**

**1. Outcome Measures**

Number of Migrant Education eligible students enrolled

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	70

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

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
805	Community Institutions, Health, and Social Services
806	Youth Development

**Outcome #3**

**1. Outcome Measures**

Increase the number of program participants serving as leaders on Committees

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	12

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

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
608	Community Resource Planning and Development

**Outcome #4**

**1. Outcome Measures**

Number of individuals (youth and volunteers) increasing knowledge and/or skills in content and careers (across subject areas ranging from animal science to environmental science to technology)

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2013	3442

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

**Issue (Who cares and Why)**

The United States is falling dangerously behind other nations in developing its future workforce of scientists, engineers, and technology experts. It faces a crisis in its ability to keep up with increasing demand for professionals trained in these fields. In Vermont, standardized test scores in science grow increasingly worse as students' age. Over 70% of intermediary and secondary students rank partially or below proficient on the 2009 NECAP test.

**What has been done**

UVM 4-H has embarked upon a 5-year plan of action to enhance professional development opportunities for educators conducting workshops, training educators plus our volunteers representing public schools, after school programs, school educators, etc. on how to deliver quality, non-formal science, technology, engineering and math (STEM) programming with a positive youth development framework. This year almost 180 camp, special interest, and school enrichment science based programs were held led by trained volunteers and staff.

**Results**

Over 2300 youth, increased their knowledge and/or skills in subject areas ranging from animal science to environmental science to technology. At one recent SET event, 88% of the youth participant's evaluations had members reporting learning something new that was fun or a lot of fun and offered ideas for next years event. According to The YEAK report, 4-H Science has a positive impact on youth interest and engagement in future STEM-related programs. The survey indicates that fifty-nine percent would like to have a job related to science when they graduate from school. Using that data, 1357 Vermont youth are not only likely to participate in future STEM programs, but pursue future STEM related careers.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
806	Youth Development

**Outcome #5**

**1. Outcome Measures**

Number of individuals who use leadership and decision making skills in executing their role and responsibilities effectively developing and/or implementing policy

Not Reporting on this Outcome Measure

**Outcome #6**

**1. Outcome Measures**

Increase the number of parents understanding family transition through parentage, divorce or separation who understand the impact of these changes on their children.

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	1097

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

**Issue (Who cares and Why)**

The estimated divorce rate in the US is close to 50 percent. Divorce is complicated for parents and full of strong emotions. Children can be caught up in the emotional dramas that can play out. Vermont family court, with the support of family court judges and attorneys, requires parents of minor children involved in family court to attend COPE, a four-hour course.

**What has been done**

Since 2010 almost 500 COPE workshops have been held. Each is taught by a female, male team instructor. Once each year instructors meet with the faculty and program manager where they share new experiences and new solutions and tweak the curriculum. An evaluation is completed by all COPE participants when they arrive and again at the end of the course. Class evaluations indicate that many participants are initially not happy to have to take the class but at the end are appreciative of COPE's educational methods.

**Results**

Parent responses, numbering about 3300 for 2012 and 2013 understand if you act in the kids best interest, they are going to be OK. Thousands of parents asked always say they want their children to be happy, come out with the least harm, feel safe and loved. One parent said, "It has really helped me to do the right thing by my kids as I go through my divorce. Thank-you so much for the program, the information I got was eye opening."

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
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802 Human Development and Family Well-Being

**Outcome #7**

**1. Outcome Measures**

Number of farmers with disabilities maintaining employment

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2013	46

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

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
802	Human Development and Family Well-Being
805	Community Institutions, Health, and Social Services

**Outcome #8**

**1. Outcome Measures**

increase in number of youth reached with positive youth development programming demonstrate mastery for targeted life skills, including: Decision making; wise use of resources; communication; accepting differences; leadership; useful/marketable skills; healthy lifestyle choices; and/or self-responsibility

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	1304

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

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
806	Youth Development

**Outcome #9**

**1. Outcome Measures**

Number of volunteers and staff demonstrating new techniques/activities in clubs and programs learned through 4-H training and development

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	108

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

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
802	Human Development and Family Well-Being
806	Youth Development

**Outcome #10**

**1. Outcome Measures**

the number of new and maintained collaborations on events with agency and industry personnel to address safety (farm, food, etc.) and emergency preparedness

Not Reporting on this Outcome Measure

**Outcome #11**

**1. Outcome Measures**

the number of published policy changes addressing best practices in child welfare.

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	1

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

**Issue (Who cares and Why)**

In Vermont 6,836 children - 5.4 percent of all children in the state live with grandparents or other relatives per the 2010 US Census. These children have been impacted by trauma. Though most Grandparents are willing to step in it is usually an unplanned event bringing unanticipated challenges as they care for traumatized children. Working with family members requires a different skill set for Department of Children Families (DCF) workers. They are constantly seeking to acquire new tools for working with families.



**What has been done**

Extension is working with Vermont Kin as Parents and other stakeholder groups to review and inform state policies. Extension collects and maintains the data for the Vermont Probate Court system which identifies the number of guardians who state that they were referred to probate by DCF. While occasionally this would be appropriate, it is an emerging area of practice and there are many complex issues surrounding the integration of DCF and the Probate Court.

**Results**

Our data collection and analysis is helping to define parameters of these issues. Deputy commissioner for Vermont DCF has issued a policy directive for caseworkers regarding talking with families about the use of probate guardianship. The policy draws upon recent experiences of the department, on data gathered by Extension for the Vermont Probate System, and other evidence of challenges in practice with kin families. Policy directly impacts the children, the kin who care for them and the social workers who want to support them. Informed policy is critical for positive outcomes for children.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
802	Human Development and Family Well-Being
805	Community Institutions, Health, and Social Services

**Outcome #12**

**1. Outcome Measures**

Number of individuals who use skills and effectively participate in addressing community issue(s) (e.g. green infrastructure, local leadership, hunger, volunteerism, etc.)

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	13

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

**Issue (Who cares and Why)**

**What has been done**

**Results**

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
124	Urban Forestry
608	Community Resource Planning and Development
802	Human Development and Family Well-Being

#### Outcome #13

##### 1. Outcome Measures

Number of participants who are English language learners will increase their level of English proficiency

##### 2. Associated Institution Types

- 1862 Extension

##### 3a. Outcome Type:

Change in Action Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2013	43

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

###### **Issue (Who cares and Why)**

The Migrant Ed Program (MEP) recognizes that positive relationships between parents, students and schools are essential to the success of every child's academic life. When we educate our youth society benefits but without an efficient, comprehensive and multi-tiered statewide recruitment and service delivery plan, necessary educational services will not reach eligible migratory students.

###### **What has been done**

In its 3rd year of funding the out of school youth (OSY) program has matured establishing an outcome oriented educational service program. It has become a leader in services for the nation's OSY addressing the academic and social challenges our migrant student population faces. Over 600 farm visits and almost 500 school visits were completed including the weekly 1.5 hour English and life skill classes to migrant workers.

###### **Results**

In almost 3 years, 103 students have increased their English proficiency creating an educational opportunity that empowers migrant students. When young farm workers who come to Vermont access education and gain academic and life skills, their ability to make more informed and positive life choices increases. Vermont MEP youth sustain our farms, enrich our community and

support their families back home. Education affords opportunity, according to the Bureau of Labor Statistics unemployment rates go from 8.3 to 12.4% for those without a diploma. This seriously affects their ability to provide for themselves and their families, as well as the amount of support they might need from society.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
805	Community Institutions, Health, and Social Services
806	Youth Development

#### Outcome #14

##### 1. Outcome Measures

Number of participants who report improvements in children's self-regulation and attachment related behaviors

Not Reporting on this Outcome Measure

#### Outcome #15

##### 1. Outcome Measures

number of individuals who assess vulnerabilities and implement a practice to secure animal health, food safety, and/or public health protecting the food chain and market integrity

Not Reporting on this Outcome Measure

#### Outcome #16

##### 1. Outcome Measures

The number of communities or community group/organization(s) establishing or expanding projects to improve or mitigate a community issue

##### 2. Associated Institution Types

- 1862 Extension

##### 3a. Outcome Type:

Change in Action Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2013	173

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Community involvement is necessary to address local issues. Leadership skills, awareness of the issues, facilitation and technical assistance can support these efforts. Vermont's forests face a threat from three highly invasive tree pests threatening about two-thirds of the woods in Vermont. Vermont's wood products, maple sugaring and tourism industry is critical to Vermont's economic health. The maple industry alone contributes over \$30 million to the Vermont economy.

#### What has been done

Since 1996, a municipal tree management and leadership program: Stewardship of the Urban Landscape (SOUL) has graduated 350 tree stewards. The program strategically requires 20-hours of volunteer service to earn the title of Vermont Tree Steward, encouraging graduates to put their passion, knowledge and skills to work locally. In late 2011, Vermont's Forest Pest First Detectors (FPFD) program was launched in response to the growing threat of invasive tree pests.

#### Results

By September 2012, Vermont trained 93 First Detectors educating and surveying Vermont community forests. The successful recruitment of First Detectors can be attributed to the SOUL program. Together, these programs are bringing people together to advocate for, care for and protect Vermont's forests. One of these volunteers, also a FPF Detector is credited with discovering a new infestation of hemlock wooly adelgid. One local effort led by a First Detector organized a tree tagging event tying purple ribbons and tags to ash trees, a target of the Emerald Ash Borer (EAB), then held a contest to name the mannequin Queen, the Big Ash Borminator! The queen is a frequent guest at community events, educating people about a threat to their Vermont forests. Local involvement is key to addressing these threats.

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
124	Urban Forestry
608	Community Resource Planning and Development
806	Youth Development

### V(H). Planned Program (External Factors)

#### External factors which affected outcomes

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

#### Brief Explanation

## **V(I). Planned Program (Evaluation Studies)**

### **Evaluation Results**

April 2010, our Building Capacity Program was approved for funding through an Extension Outreach grant. We focused our efforts on developing 9 topic modules (Board Development, Conflict Management, Developing Volunteers, Ethical Leadership, Leading through Change, Staff Development and Evaluation, Strategic Planning, Team Leadership and Working in Teams). We created a web presence for easy access to all our materials including: 19 webinars (between 3/2011 and 4/2013); 6 interactive learning lesson; and 19 supporting tools and resources. We tracked participation in our webinars (n=81) building a data base in Mail Chimp to provide communication stream to promote our webinars and other products.  
<http://www.uvm.edu/extension/community/buildingcapacity/>

An online survey was conducted in June 2013 with the 81 webinar participants. Response rate for the survey is 43% (n=35). 97% of respondents indicated that they did participate in or viewed at least one of our webinars. 100% of those indicated that the information was useful for their needs and 63% indicated that they did apply the information or skills learned during the webinar with their organization. Webinars from the following three topics were the most attended/ viewed: Developing Volunteers, Ethical Leadership, and Leading through Change.

### **Key Items of Evaluation**

**V(A). Planned Program (Summary)**

**Program # 3**

**1. Name of the Planned Program**

Climate Change

Reporting on this Program

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	0%		28%	
104	Protect Soil from Harmful Effects of Natural Elements	0%		3%	
112	Watershed Protection and Management	0%		4%	
123	Management and Sustainability of Forest Resources	0%		28%	
125	Agroforestry	0%		13%	
132	Weather and Climate	0%		11%	
206	Basic Plant Biology	0%		11%	
601	Economics of Agricultural Production and Farm Management	0%		2%	
	<b>Total</b>	0%		100%	

**V(C). Planned Program (Inputs)**

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	6.4	0.0
Actual Paid Professional	0.0	0.0	4.4	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	454547	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	383524	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	10585	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

Invasive Pests - Monitoring of the Asian Long Horned Beetle & Hemlock Woolly Adelgid; interception and prevention if possible, mitigation through work with bioactive fungi and natural enemy species; work with the US forest service, US-ARS, and the maple industry.

Maple Production - research and extension efforts at the Proctor Maple Center are directed at extending the sugaring season, maximizing yield, and minimizing disease to trees.

Monitoring of the Eastern Forests - Species change and demarcation levels are being observed, documented and modeled for northern forests through remote sensing and on-the-ground observations.

Invasive Plants - research will continue on the genetic and physiological basis for "invasiveness" of problem plant species and introductions.

Best management practices using vegetation models

Greenhouse Gas Emissions - research has been initiated to evaluate microbial population dynamics in ruminant farm animals in an effort to control/minimize the production of methane and other greenhouse gases. Parallel efforts are underway to understand soil processes that affect the carbon cycle, and that may sequester carbon in soil sinks.

**2. Brief description of the target audience**

Researchers, Extension Faculty and Staff  
 Maple producers  
 Agriculture - Farmers

**3. How was eXtension used?**

eXtension was not used in this program

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

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

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

**Patent Applications Submitted**

Year: 2013

Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2013	Extension	Research	Total
Actual	0	16	16

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of research projects focusing on climate change.

Year	Actual
2013	6



**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Identify mitigate the invasive species threat to the environment
2	Research regarding the generation of greenhouse gas emissions from farm animals and through soil processes
3	Number of approaches towards maximizing sap yields and profits in maple sap collection systems.
4	Number of climate change management practices on Vermont farms that aid in climate change adaptation.
5	Number of ecological and evolutionary factors that influence invasive grass in Vermont.

**Outcome #1**

**1. Outcome Measures**

Identify mitigate the invasive species threat to the environment

Not Reporting on this Outcome Measure

**Outcome #2**

**1. Outcome Measures**

Research regarding the generation of greenhouse gas emissions from farm animals and through soil processes

Not Reporting on this Outcome Measure

**Outcome #3**

**1. Outcome Measures**

Number of approaches towards maximizing sap yields and profits in maple sap collection systems.

**2. Associated Institution Types**

- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2013	4

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

**Issue (Who cares and Why)**

Maple syrup producers who use tubing systems would be interested as tubing systems typically become less productive as they age.

**What has been done**

The researcher constructed an economic model for producers to use as a tool to estimate effects of various strategies on sap yields and net profits.

**Results**

The use of new spouts annually, the use of check-valve spouts, spout and tubing cleaning, and replacement of droplines increased the yields by varying amounts.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
125	Agroforestry
206	Basic Plant Biology

#### Outcome #4

##### 1. Outcome Measures

Number of climate change management practices on Vermont farms that aid in climate change adaptation.

##### 2. Associated Institution Types

- 1862 Research

##### 3a. Outcome Type:

Change in Knowledge Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2013	4

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

###### Issue (Who cares and Why)

Climate change is expected to impact farming through precipitation increases, changes in crop suitability (e.g. apples) and decreases in milk productivity capacity.

###### What has been done

The researcher has sampled greenhouse gases on farms, photo-documented dozed different farms, created five sets of photo simulations illustrating existing conditions.

###### Results

Researcher has interfaced project with a related project to create a list of climate change best practices. The researcher has made connections with several farms and will sample greenhouse gases for the next two years. Researcher has disseminated results at a number of workshops.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
104	Protect Soil from Harmful Effects of Natural Elements
112	Watershed Protection and Management

125 Agroforestry  
601 Economics of Agricultural Production and Farm Management

**Outcome #5**

**1. Outcome Measures**

Number of ecological and evolutionary factors that influence invasive grass in Vermont.

**2. Associated Institution Types**

- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2013	1

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

**Issue (Who cares and Why)**

Invasive grass species can decrease native species diversity and alter ecosystem processes.

**What has been done**

Researcher carried out field and greenhouse experiments on both native and invasive species in both native range in Europe and invasive range in North America showing that some invasive populations are very aggressive.

**Results**

Continued introduction of different variants for horticultural or agronomic plant species can increase the invasive potential of these species and increase the grass ability to spread into new areas. Changes in key traits like C:N content of leaves can result in increased aggressiveness of reedcanary grass making it more likely to take over wetlands.

**4. Associated Knowledge Areas**

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

**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

**Brief Explanation**

{No Data Entered}

**V(I). Planned Program (Evaluation Studies)**

**Evaluation Results**

{No Data Entered}

**Key Items of Evaluation**

{No Data Entered}

**V(A). Planned Program (Summary)**

**Program # 4**

**1. Name of the Planned Program**

Sustainable Energy

Reporting on this Program

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
402	Engineering Systems and Equipment	20%		0%	
601	Economics of Agricultural Production and Farm Management	80%		100%	
	<b>Total</b>	100%		100%	

**V(C). Planned Program (Inputs)**

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.9	0.0	1.0	0.0
Actual Paid Professional	0.1	0.0	0.4	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
8830	0	67451	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
21338	0	33931	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
25170	0	0	0

**V(D). Planned Program (Activity)**

1. Brief description of the Activity

Energy Crop Research Projects

Renewable energy workshops

**2. Brief description of the target audience**

- Agriculture: Service Providers
- Agriculture: Crop Producers
- Agriculture: Farmers

**3. How was eXtension used?**

eXtension was not used in this program

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	142	0	0	0

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

**Patent Applications Submitted**

Year: 2013  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2013	Extension	Research	Total
<b>Actual</b>	0	8	8

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Research Projects

<b>Year</b>	<b>Actual</b>
2013	19

**Output #2**

**Output Measure**

- Workshop - single session

<b>Year</b>	<b>Actual</b>
2013	4



**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	the number of individuals who implement recommended practice(s) beginning energy crop production or increasing yield and/or quality of existing crops contributing to a sustainable, cost effective energy source

## **Outcome #1**

### **1. Outcome Measures**

the number of individuals who implement recommended practice(s) beginning energy crop production or increasing yield and/or quality of existing crops contributing to a sustainable, cost effective energy source

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### **3a. Outcome Type:**

Change in Action Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	27

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

#### **Issue (Who cares and Why)**

Oilseed-type sunflower is a relatively new crop for the state of Vermont, with the potential to add value to farms. Unfortunately, bird and insect pests have limited the overall yield potential with seed and oil yields traditionally lower than national averages. Birds have decimated up to 80% of growers' sunflower fields, migrating through and quickly decreasing yields. Insect pests like the Banded Sunflower Moth have proven devastating to seed yields and quality by feeding on the meal inside seeds.

#### **What has been done**

To address issues of pest predation, UVM Extension initiated on-farm research trials evaluating sunflower planting dates ranging from mid-May to late June. Later planting dates resulted in higher seed and oil yields and, often, greater test weights, indicating better seed quality. UVM Extension began recommending to some growers that selecting a shorter-season variety and planting in June, as opposed to earlier in the spring, may help to mitigate pest pressures.

#### **Results**

One grower took UVM Extension's crop recommendations delaying planting by several weeks, and his calculated seed yield was 3410 lbs per acre, highest in the statewide survey and well above the national average of 1733 lbs per acre. Vermont's continued participation in the National Sunflower Survey has allowed for the tracking of yield data across years and the resources to conduct research and outreach has enabled UVM Extension's continued work on Integrated Pest Management in sunflower. In Vermont this has resulted in an increase in average seed yield enabling the crop to be considered a viable option for diversified farmers in the region.

### **4. Associated Knowledge Areas**

**KA Code**    **Knowledge Area**  
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
- Government Regulations

**Brief Explanation**

**V(I). Planned Program (Evaluation Studies)**

**Evaluation Results**

Oilseed producers were surveyed at the annual oilseed producer meeting and online to identify if information generated and delivered by the UVM oilseed program has improved yield and quality of the crop. Farmers indicated that UVM programs helped them improve yield and quality by reducing pest pressure, assisting with variety selection and other agronomic practices.

**Key Items of Evaluation**

**V(A). Planned Program (Summary)**

**Program # 5**

**1. Name of the Planned Program**

Childhood Obesity

Reporting on this Program

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
607	Consumer Economics	0%		7%	
609	Economic Theory and Methods	0%		7%	
703	Nutrition Education and Behavior	96%		39%	
704	Nutrition and Hunger in the Population	2%		0%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	0%		7%	
724	Healthy Lifestyle	2%		40%	
	<b>Total</b>	100%		100%	

**V(C). Planned Program (Inputs)**

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	2.0	0.0	1.8	0.0
Actual Paid Professional	0.3	0.0	2.6	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
20836	0	167326	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
50349	0	390207	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
59392	0	8585	0

## V(D). Planned Program (Activity)

### 1. Brief description of the Activity

Diabetes Education: eXtension Diabetes CoP, website update and newsprint articles

Healthy Eating: - Nutrition classes designed for a wide range of people, with an emphasis on national dietary guidance. Participants learn the latest information about how to choose a healthy diet, practice food safety and to incorporate physical activity into their day. Classes range from one to six sessions, with the topics tailored for the group requesting the program.

Bridges to Health- organizing health access to Spanish speaking farm workers in cooperation with college of medicine and local clinics.

Personality trait(s) predictors of healthy diet and obesity  
 Linking time use to obesity  
 Incentives for college students to be more physically active  
 Assessing children's fruit and vegetable intake

### 2. Brief description of the target audience

- Adults
- Communities: Educators
- Public: Spanish speaking farm workers
- Public: Daycare Providers
- Age 6 - 12 School Age
- College Students
- Researchers
- Policy makers
- Academic audiences

### 3. How was eXtension used?

Faculty member was co- chair of CoP, developed resources

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	152	650	250	0

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

**Patent Applications Submitted**

Year: 2013

Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2013	Extension	Research	Total
<b>Actual</b>	1	11	12

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Consultation

Year	Actual
2013	47

**Output #2**

**Output Measure**

- Consumer Publication  
Not reporting on this Output for this Annual Report

**Output #3**

**Output Measure**

- Curriculum  
Not reporting on this Output for this Annual Report

**Output #4**

**Output Measure**

- Fact Sheets  
Not reporting on this Output for this Annual Report

**Output #5**

**Output Measure**

- Publication - Newprint

<b>Year</b>	<b>Actual</b>
2013	6

**Output #6**

**Output Measure**

- Train the trainer program  
Not reporting on this Output for this Annual Report

**Output #7**

**Output Measure**

- Workshop Series

<b>Year</b>	<b>Actual</b>
2013	4

**Output #8**

**Output Measure**

- Workshop - single session

<b>Year</b>	<b>Actual</b>
2013	8

**Output #9**

**Output Measure**

- Webpage (new and updated)

<b>Year</b>	<b>Actual</b>
2013	14

**Output #10**

**Output Measure**

- Presentation

Not reporting on this Output for this Annual Report

**Output #11**

**Output Measure**

- Interviews

<b>Year</b>	<b>Actual</b>
2013	8

**Output #12**

**Output Measure**

- Radio

<b>Year</b>	<b>Actual</b>
2013	5

**Output #13**

**Output Measure**

- Television

<b>Year</b>	<b>Actual</b>
2013	7



**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Number the individuals who incorporate one or more healthful eating practices and/or physical activity to prevent/manage disease and/or obesity
2	Number of individuals who use food planning and wise shopping behaviors improve diet and the supply of food
3	The number of individuals who select and prepare a variety of produce to help prevent/manage disease and/or obesity
4	Number of methodologies that measure children's fruit and vegetable consumption in the school setting.
5	Number of time use patterns for food purchasing, preparation/clean up, eating/drinking and traveling associated with food consumption
6	Number of proven strategies that encourage exercise in first year college students

## **Outcome #1**

### **1. Outcome Measures**

Number the individuals who incorporate one or more healthful eating practices and/or physical activity to prevent/manage disease and/or obesity

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### **3a. Outcome Type:**

Change in Action Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	143

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

#### **Issue (Who cares and Why)**

Spanish speaking workers in Vermont are estimated to make up 50% of the farm employees. Something as simple as making a doctor's appointment can be nearly impossible when faced with language barriers, lack of transportation and concerns over costs for services. Bridges to Health's overall goal is to work with health clinics to make them aware of cultural differences and help them identify and reduce barriers to improve access and coordination of care for the Spanish speaking workers and their families.

#### **What has been done**

The program staff assists migrant farm workers by coordinating health appointments, ensuring the use of interpreter services, providing educational materials in Spanish and referring them to other services as needed. The program has also partnered with the College of Medicine residents to provide wellness visits to farms.

#### **Results**

In 2012, 143 farm workers have been reached providing quality health care access for them and/or their families. Like all workers when they and their families are healthy, are secure in knowing they can get health care if needed, are healthier and happier. They provide a reliable work force necessary on our Vermont farms today.

### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
703	Nutrition Education and Behavior
724	Healthy Lifestyle

## **Outcome #2**

### **1. Outcome Measures**

Number of individuals who use food planning and wise shopping behaviors improve diet and the supply of food

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### **3a. Outcome Type:**

Change in Action Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	23

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

#### **Issue (Who cares and Why)**

It is important for children to develop positive nutrition and physical activity behaviors at an early age, both for good health and to achieve their full academic potential. Research shows that the younger a child becomes overweight, the higher likelihood that weight concerns will still be prevalent in adolescence and adulthood<sup>1</sup>. The environments in which children learn, play and grow can influence the extent to which they choose healthy behaviors. Childcare centers need on-going training, technical assistance, mentoring and financial support.

#### **What has been done**

The Green Mountain Healthy Kids Challenge enrolled 31 childcare Centers across Vermont in a one-year program. Participating childcare Centers attended day-long workshops at the beginning and end of the project, each was matched with a mentor who provided support throughout the year in one or more of five areas including 1) nutrition standards, 2) nutrition education, 3) eating environment, 4) physical activity, and 5) communication, promotion and monitoring.

#### **Results**

Change over the course of the year was measured in a number of areas across a broad spectrum of topics ranging from specific practices to revised policies. Pre-post assessments showed a number of improvements. For example, in the category of specific practices, some Centers reported improving their nutrition guidelines for children and infants, their ability to meet special dietary needs, the food they served at celebrations, their fundraising practices as they related to food, and access to drinking water. Twenty-three Centers showed an overall improvement in their menus in areas related to fruits, vegetables, whole grains and/or lean meats. Additionally, 20 Centers had improved wellness policies at the end of the intervention, compared to program onset.

#### 4. Associated Knowledge Areas

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

#### Outcome #3

##### 1. Outcome Measures

The number of individuals who select and prepare a variety of produce to help prevent/manage disease and/or obesity

Not Reporting on this Outcome Measure

#### Outcome #4

##### 1. Outcome Measures

Number of methodologies that measure children's fruit and vegetable consumption in the school setting.

##### 2. Associated Institution Types

- 1862 Research

##### 3a. Outcome Type:

Change in Knowledge Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2013	1

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

###### **Issue (Who cares and Why)**

As of 2010, 32% of children and adolescents were overweight or obese in the United States (US) (ogden et al. 2012). Overweight and obesity remains a health risk for close to one third of American children and adolescents. Childhood overweight and obesity have been associated with risk factors for cardiovascular disease and type 2 diabetes (Hannon et al. 2005; Freedman et al. 2007).

###### **What has been done**

In school settings, trained research teams assessed intake of school lunches with three dietary assessment methods; plate waste, observation, photography

###### **Results**

Establishment of a reliable and valid methodology for assessing school children's consumption of fruits and vegetables in a variety of school cafeteria environments. Research has demonstrated that school lunch participants consume more fruits and vegetables than non-participants.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

#### Outcome #5

##### 1. Outcome Measures

Number of time use patterns for food purchasing, preparation/clean up, eating/drinking and traveling associated with food consumption

##### 2. Associated Institution Types

- 1862 Research

##### 3a. Outcome Type:

Change in Knowledge Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2013	3

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

###### Issue (Who cares and Why)

The amount of time spent preparing food and cleaning up since the 1960s has dropped by nearly 50%. This had led to more people eating unhealthy, such as processed.

###### What has been done

The project investigates the effects of food venue choice and time use on obesity in men and women using structural equation modeling (SEM) techniques. The investigator uses two studies; American Time Use Surveys and the Current Population Survey to explore time use patterns related to food consumption

###### Results

Decreasing television screen time by 30 minutes per day, replace with food preparation, activity, and mindful eating can save lives and improve the health care industry.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
607	Consumer Economics

609	Economic Theory and Methods
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population
724	Healthy Lifestyle

**Outcome #6**

**1. Outcome Measures**

Number of proven strategies that encourage exercise in first year college students

**2. Associated Institution Types**

- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2013	1

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

**Issue (Who cares and Why)**

The results of this study can be used by insurance companies or employers who may be interested in providing financial incentives for health behavior change.

**What has been done**

117 students were randomized to one to three groups: continued incentives, discontinued incentives, or control. 12 weeks during fall semester, continued incentives and discontinued incentive received weekly incentives. 12 weeks during spring semester discontinued group received no incentives while continued incentive group received incentives on variable interval schedule.

**Results**

Results were monitored by fitness center use, other outcomes measured in weight, height & BMI. Incentives significantly increased the number of students who met fitness center goals. When incentives were removed for the discontinued group, they stopped attending the fitness center. Incentives need to be sustained in order to be effective.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
724	Healthy Lifestyle

## **V(H). Planned Program (External Factors)**

### **External factors which affected outcomes**

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

### **Brief Explanation**

## **V(I). Planned Program (Evaluation Studies)**

### **Evaluation Results**

The Green Mountain Healthy Kids Challenge enrolled 31 childcare Centers across Vermont in a one-year program aimed at increasing opportunities for children to improve their nutrition and physical activity-related behaviors. Participating childcare Centers attended day-long workshops at the beginning and end of the project, and were each matched with a mentor who provided support throughout the year in one or more of five focal areas including 1) nutrition standards, 2) nutrition education, 3) eating environment, 4) physical activity, and 5) communication, promotion and monitoring.

Comparative menu analysis of 27 childcare centers from across Vermont (participants in the Green Mountain Healthy Kids Challenge program) was completed. Childcare Centers submitted a months worth of menus in March of 2012 and March of 2013. Menus were reviewed to determine whether they stayed the same, improved, or worsened in various food categories from one year to the next. Primary categories of interest included fruits, vegetables, lean meats and whole grains. Twenty-three Centers had overall improvement in their menus.

Change over the course of the year was measured in a number of areas across a broad spectrum of topics ranging from specific practices to revised policies. Pre-post assessments showed a number of improvements. For example, in the category of specific practices, some Centers reported improving their nutrition guidelines for children and infants, their ability to meet special dietary needs, the food they served at celebrations, their fundraising practices as they related to food, and access to drinking water. Twenty-three Centers showed an overall improvement in their menus in areas related to fruits, vegetables, whole grains and/or lean meats. Additionally, 20 Centers had improved wellness policies at the end of the intervention, compared to program onset.

#### References:

- 1) 1) Guo, S. S., & Chumlea, W. C. (1999). Tracking of body mass index in

children in relation to overweight in adulthood. The American Journal of Clinical Nutrition, 70(1), 145S-148S

2) 2) Fitzgibbon M, Stolley M, Van Horn L, K KauferChristoffel, Dyer A. (2005). Two-year follow-up results for Hip-Hop to Health Jr.: A randomized controlled trial for overweight prevention in preschool minority children. J Pediatr., 146:618-625

Bridges to Health project works to engage Migrant workers in their health care. Often fearful to leave the farm or because of a lack of access to transportation Migrant workers and families do not or can not access health care professionals. Personal relationships to build trust are critical to workers accessing health care and seeking health education. Personal observation with each client allowed collection of data regarding access.

### **Key Items of Evaluation**



**V(A). Planned Program (Summary)**

**Program # 6**

**1. Name of the Planned Program**

Food Safety

Reporting on this Program

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
311	Animal Diseases	0%		8%	
604	Marketing and Distribution Practices	0%		9%	
607	Consumer Economics	0%		9%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	30%		0%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	70%		66%	
722	Zoonotic Diseases and Parasites Affecting Humans	0%		8%	
	<b>Total</b>	100%		100%	

**V(C). Planned Program (Inputs)**

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	2.7	0.0
Actual Paid Professional	0.3	0.0	5.1	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
33461	0	320183	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
80858	0	320247	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
95381	0	14503	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

Research - rapid detection of food-borne pathogens. Improving animal health  
**Food Safety and Sanitation** - Work with small scale producers on best practices that enable them to provide a safe food product for markets in-state and out. Good Agricultural Practice (GAP) certification work including producers not seeking certification but who wish to follow GAP will occur with producers. This project also encompasses the requests and resulting work by individuals/groups for information through phone, e-mail or in-person on general food safety questions.

**2. Brief description of the target audience**

- Public: General
- Small scale meat and produce farmers/producers
- Artisan cheese facilities
- Dairy farmers
- 

**3. How was eXtension used?**

Not used

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	725	0	0	0

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

**Patent Applications Submitted**

Year: 2013  
 Actual: 1

**Patents listed**

.Whey protein polymerization and its application in yogurt making as a thickening agent. ZL. 201210196810.X.

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2013	Extension	Research	Total
Actual	0	2	2

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Consultations  
 Not reporting on this Output for this Annual Report

**Output #2**

**Output Measure**

- Newsprint Article

Year	Actual
2013	17

**Output #3**

**Output Measure**

- Workshop - single session

Year	Actual
2013	27

**Output #4**

**Output Measure**

- Presentations

<b>Year</b>	<b>Actual</b>
2013	2

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Number of people who show improvement in food safety and preservation practices
2	Number of strategies to detect Listeria in artisan cheese facilities.
3	Number of transdisciplinary approaches to understand and manage artisanal cheese food safety, including on-farm and consumer research addressing raw fluid milk marketing direct to consumers and raw milk products produced on Vermont farms.

## **Outcome #1**

### **1. Outcome Measures**

Number of people who show improvement in food safety and preservation practices

### **2. Associated Institution Types**

- 1862 Extension

### **3a. Outcome Type:**

Change in Action Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	27

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

#### **Issue (Who cares and Why)**

Small scale food processing is an important part of Vermont's economy, with over \$100 million dollars in sales in 2012. It is essential that all food producers and processors use safe practices to prevent foodborne illness outbreaks. Food producers must meet the food safety requirements however they can be difficult for small-scale producers and processors to understand. The Vermont Food Venture Center (VFVC) provides commercial kitchen space and resources to many of these small-scale food processors to start and /or grow their food businesses.

#### **What has been done**

Extension served as a resource to the VFVC staff, as well as the processors using the facility to answer questions, provide information and technical assistance, and also teach courses on various food safety topics at their facility. One of those subjects is canned food safety, including a requirement called a "scheduled process."

#### **Results**

VFVC now has 27 businesses producing out of their facility, with many more businesses utilizing the intellectual resources available through VFVC. Most of the businesses are now in compliance with state and federal food safety regulations, which enables them to be able to sell their products in more markets, particularly more lucrative ones such as outdoor Farmers Markets in Boston and through specialty food distributors. VFVC has now produced over 100 different products out of their facility since they opened in January 2012, many of which are canned foods. One staff member added, "These people have been able to implement the recommended food safety practices and thus improve their business."

### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
----------------	-----------------------

607 Consumer Economics  
712 Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

## **Outcome #2**

### **1. Outcome Measures**

Number of strategies to detect Listeria in artisan cheese facilities.

### **2. Associated Institution Types**

- 1862 Research

### **3a. Outcome Type:**

Change in Action Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	1

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

#### **Issue (Who cares and Why)**

Consumer interest in artisan and farmstead cheeses is driving explosive growth of on-farm cheese operations throughout the United States. As a result, there is a need for focus on assuring the microbiological safety of cheeses produced on farms.

#### **What has been done**

Assessed fate of *L. monocytogenes* in washed rind cheeses aged for 60 days, assessed the efficacy of anti-listeria products in mitigating Listeria contamination of washed rind cheeses, compared the efficacy of intervention procedures for decontamination of materials used for "smear" or "wash" application during cheese making, identified sources and niches of Listeria contamination facilities producing high risk, washed-rind cheeses, compared use of testing systems, and developed risk reduction protocols to control Listeria contamination in farmstead cheese facilities.

#### **Results**

This project provides a plan, through microbiological risk management technologies, to help small scale artisan cheese makers meet the requirements of the Food Safety Modernization Act.

### **4. Associated Knowledge Areas**

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

### **Outcome #3**

#### **1. Outcome Measures**

Number of transdisciplinary approaches to understand and manage artisanal cheese food safety, including on-farm and consumer research addressing raw fluid milk marketing direct to consumers and raw milk products produced on Vermont farms.

#### **2. Associated Institution Types**

- 1862 Research

#### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

#### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	3

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

##### **Issue (Who cares and Why)**

Demand for artisanal cheeses, including raw milk cheeses has increased in the United States and Vermont is a leader in on-farm artisanal cheese production with more cheese makers per capita than any other state.

##### **What has been done**

Project takes three pronged transdisciplinary approaches to understand and manage artisanal cheese food safety. The first approach identifies pathogen epidemiology and testing, food safety concerns and practical risk management practices at the site of dairy product production; second approach seeks to understand consumer attitudes, beliefs, and practices related to raw milk products; and the third approach integrates the finding from the research efforts to develop outreach and extension materials targeting artisanal cheese producers and stakeholders.

##### **Results**

tbd

#### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
311	Animal Diseases
604	Marketing and Distribution Practices
607	Consumer Economics
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
- Other (Food safety requirements of food)

**Brief Explanation**

Do we make a note here about Extension retirement - we have lost all our faculty in this area.

**V(I). Planned Program (Evaluation Studies)**

**Evaluation Results**

{No Data Entered}

**Key Items of Evaluation**

{No Data Entered}

**V(A). Planned Program (Summary)**

**Program # 7**

**1. Name of the Planned Program**

Urban Non Point Source Pollution

Reporting on this Program

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
112	Watershed Protection and Management	94%		100%	
135	Aquatic and Terrestrial Wildlife	6%		0%	
	<b>Total</b>	100%		100%	

**V(C). Planned Program (Inputs)**

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	0.4	0.0
Actual Paid Professional	0.0	0.0	1.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	49011	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	54320	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
139805	0	2667	0

**V(D). Planned Program (Activity)**

1. Brief description of the Activity

- **Urban Watershed and Water Quality:** work with towns, municipalities, community organizations with consultations, demonstrations, workshops, newsprint, presentation, youth camps
- **Watershed & Water Quality Programs:** Watershed education for educators and students, and community members with consultation, train the trainer, demonstration, field site visits
- **Design, testing and implementation** of materials and technologies for the removal of phosphorus from agricultural run-off and suburban wastewater non-point sources

**2. Brief description of the target audience**

- Youth
- Adult
- Agriculture/Natural Resources: Watershed Based Organizations
- Agriculture: Fish Farmers
- Communities: Cities and Towns
- Communities: Local Officials/Leaders
- Communities: Non-Governmental Organizations
- Communities: Schools
- Environmental Professionals: Environmental Managers
- Public: fishing and boating groups

**3. How was eXtension used?**

eXtension was not used in this program

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	939	5400	1405	0

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

**Patent Applications Submitted**

Year: 2013  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2013	Extension	Research	Total

<b>Actual</b>	0	4	0
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**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Consultation

<b>Year</b>	<b>Actual</b>
2013	4

**Output #2**

**Output Measure**

- Demonstration

<b>Year</b>	<b>Actual</b>
2013	1

**Output #3**

**Output Measure**

- Field day/Fair

<b>Year</b>	<b>Actual</b>
2013	4

**Output #4**

**Output Measure**

- Presentation

<b>Year</b>	<b>Actual</b>
2013	2

**Output #5**

**Output Measure**

- Fact Sheet

<b>Year</b>	<b>Actual</b>
2013	7

**Output #6**

**Output Measure**

- Tour  
Not reporting on this Output for this Annual Report

**Output #7**

**Output Measure**

- Train the Trainer

<b>Year</b>	<b>Actual</b>
2013	10

**Output #8**

**Output Measure**

- Web page updating

<b>Year</b>	<b>Actual</b>
2013	4

**Output #9**

**Output Measure**

- Workshop series

<b>Year</b>	<b>Actual</b>
2013	29

**Output #10**

**Output Measure**

- Workshop - single session

<b>Year</b>	<b>Actual</b>
2013	36

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Number of feet of shoreline/bank vegetation planted or native vegetation maintained
2	Number of municipalities who apply BMP for climate change related shoreline erosion and bank stabilization
3	Number of research outcomes used for planning climate change adaptation
4	Fish culture facilities in NY and VT are using NRAC recommended biosecurity BMP practices
5	Number of schools using Watershed Alliance curriculum equal to or above long term (5 year) average
6	Number of LC bass tournament organizers that have adopted aquatic invasive species (AIS) spread prevention BMP?HACCP tournament protocols
7	Number participating Adirondack lake associations in the Champlain drainage apply for Adirondack Park Agency general permits for management of aquatic invasive plants
8	Number of high school, undergraduate students involved in watershed/lake restoration
9	Number of municipalities with new or updated shoreline/riparian vegetation ordinances
10	Number of non-students involved in watershed/lake restoration
11	Number of volunteer days annually reported by local organizations engaged in habitat restoration programs
12	Number of commercial properties using low input grounds care
13	Number of municipalities implementing green infrastructure and Low Impact Development (LID) strategies
14	Number of gallons of storm water prevented from reaching local water bodies
15	Number of marinas participating in Clean Marinas and/or Clean Boating programs

**Outcome #1**

**1. Outcome Measures**

Number of feet of shoreline/bank vegetation planted or native vegetation maintained

Not Reporting on this Outcome Measure

**Outcome #2**

**1. Outcome Measures**

Number of municipalities who apply BMP for climate change related shoreline erosion and bank stabilization

Not Reporting on this Outcome Measure

**Outcome #3**

**1. Outcome Measures**

Number of research outcomes used for planning climate change adaptation

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2013	2

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

**Issue (Who cares and Why)**

To reduce community vulnerability, a flood assessment assists communities to better plan for changing flood conditions driven by climate change. The Geomorphic Stream Assessment (GSA), a vulnerability assessment is a compilation of existing and often disconnected information on a town's water resources. Through this process, developed in collaboration with towns and the planning commission, gaps in information and vulnerabilities are highlighted. and towns are provided with recommendations and resources for future planning.

**What has been done**

Working with a local partner (PMNRCD) we evaluated how well GSA predicted stream changes and how recommended actions performed under Tropical Storm Irene conditions. Overall, projects based on GSA data and recommendations withstood Tropical Storm Irene flood waters. Structural failures were high where GSA mitigations were not implemented.

**Results**

For Gully Brook, near Poultney VT, GSA recommended berm removal for channel restoration and access to floodplain, and removal of accumulated sediment from the Castleton River confluence was done. This was done prior to Tropical Storm Irene, and prevented property flooding and bridge washout. Nearby areas receiving similar recommendations that were not implemented suffered severe flooding and road washout.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
112	Watershed Protection and Management

**Outcome #4**

**1. Outcome Measures**

Fish culture facilities in NY and VT are using NRAC recommended biosecurity BMP practices

Not Reporting on this Outcome Measure

**Outcome #5**

**1. Outcome Measures**

Number of schools using Watershed Alliance curriculum equal to or above long term (5 year) average

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	5

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

**Issue (Who cares and Why)**



**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
112	Watershed Protection and Management

**Outcome #6**

**1. Outcome Measures**

Number of LC bass tournament organizers that have adopted aquatic invasive species (AIS) spread prevention BMP?HACCP tournament protocols

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	1

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

**Issue (Who cares and Why)**

The costs associated with invasive species invasions are substantial. According to the NY Invasive Species Task Force, the calculated economic impact to the United States as a whole exceeds \$120 billion. An act to amend the Environmental Conservation Law, in relation to creating the New York Invasive Species Council became a law August 28, 2007 with the approval of the Governor. Four outlined tasks led to 4 teams which formed the basis of an invasive species bill made into law on July 24, 2012.

**What has been done**

LCSG staff conducted aquatic invasive species spread prevention training at 3 major bass tournaments in Plattsburgh during June-July 2012, reaching 2 major tournament organizers and nearly 600 hundred tournament anglers. Anglers received updates on invasive species impacts, and spread prevention practices. FLW Outdoors asked staff to visit the company's headquarters and laid out some "pro-active" steps that tournament organizers are taking in the Midwest.

**Results**

Forty two nationally known tournament anglers signed pledges to demonstrate their commitment to ?Clean, Drain, Dry? invasive species spread prevention best management practices developed

by the Stop Aquatic Hitchhikers campaign and the Great Lakes Sea Grant network. FLW Outdoors Inc., the nation's largest fishing tournament-fishing organization, staging hundreds of tournaments annually, including several in Plattsburgh, NY has instituted a new cleaning protocol for their weigh-in equipment which travels across the country. Vermont and New York each border Lake Champlain. New York and Vermont Sea Grant work collaboratively to protect our waters.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management

#### Outcome #7

##### 1. Outcome Measures

Number participating Adirondack lake associations in the Champlain drainage apply for Adirondack Park Agency general permits for management of aquatic invasive plants

Not Reporting on this Outcome Measure

#### Outcome #8

##### 1. Outcome Measures

Number of high school, undergraduate students involved in watershed/lake restoration

##### 2. Associated Institution Types

- 1862 Extension

##### 3a. Outcome Type:

Change in Knowledge Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2013	7

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

**Issue (Who cares and Why)**

**What has been done**

**Results**

#### 4. Associated Knowledge Areas

**KA Code**    **Knowledge Area**  
112            Watershed Protection and Management

**Outcome #9**

**1. Outcome Measures**

Number of municipalities with new or updated shoreline/riparian vegetation ordinances

Not Reporting on this Outcome Measure

**Outcome #10**

**1. Outcome Measures**

Number of non-students involved in watershed/lake restoration

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	52

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

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

**KA Code**    **Knowledge Area**  
112            Watershed Protection and Management

**Outcome #11**

**1. Outcome Measures**

Number of volunteer days annually reported by local organizations engaged in habitat restoration programs

Not Reporting on this Outcome Measure

**Outcome #12**

**1. Outcome Measures**

Number of commercial properties using low input grounds care

Not Reporting on this Outcome Measure

**Outcome #13**

**1. Outcome Measures**

Number of municipalities implementing green infrastructure and Low Impact Development (LID) strategies

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	1

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

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
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{No Data} null

**Outcome #14**

**1. Outcome Measures**

Number of gallons of storm water prevented from reaching local water bodies

Not Reporting on this Outcome Measure

**Outcome #15**

**1. Outcome Measures**

Number of marinas participating in Clean Marinas and/or Clean Boating programs

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2013	4

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

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
112	Watershed Protection and Management

## **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
- Other (technology limitations in areas)

### **Brief Explanation**

## **V(I). Planned Program (Evaluation Studies)**

### **Evaluation Results**

Watershed signs are ubiquitous nationwide. The most cited rationale for using signs is to increase knowledge, attitude and or behavior, usually area residents, to better protect watersheds and water quality. However, questions have been raised about the efficacy and cost of sign projects.

Part of a 15 sign watershed sign project on the Burlington -S. Burlington Englesby Brook watershed included interviews of ~ 180 pedestrians/bicyclists pre-project and a similar number post-project in 5 locations around the watershed boundary where signs were put in place. A brief series of questions (4 pre-, 5 post-) provided a rapid estimate of pre- and post- project knowledge, attitude and behavior related to the local watershed and water quality.

To evaluate the impact of watershed signs on resident knowledge, attitude and behavior, we surveyed over 400 pedestrians in a small (0.9 sq. mi) impaired urban watershed in Burlington, VT. Using a brief a pre-/post- questionnaire, we found watershed signs had two statistically significant effects: a) awareness of watersheds in general and the target watershed in particular increased, and b) respondent behavior (defined as actively seeking additional information) increased, but more modestly. Respondent's attitude (importance of local water quality protection) did not differ significantly, perhaps because pre-sign attitude levels were already elevated.

### **Key Items of Evaluation**