## 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 | 100% | | 50% | |
| 132 | Weather and Climate | 0% | | 50% | |
| | **Total** | 100% | | 100% | |

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

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

| Year: 2012 | Extension | | Research | |
|---|---|---|---|---|
| | 1862 | 1890 | 1862 | 1890 |
| Plan | 3.0 | 0.0 | 0.4 | 0.0 |
| Actual Paid Professional | 2.4 | 0.0 | 0.7 | 0.0 |
| Actual Volunteer | 0.3 | 0.0 | 0.0 | 0.0 |

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

| Extension | | Research | |
|---|---|---|---|
| **Smith-Lever 3b & 3c** | **1890 Extension** | **Hatch** | **Evans-Allen** |
| 87560 | 0 | 33950 | 0 |
| **1862 Matching** | **1890 Matching** | **1862 Matching** | **1890 Matching** |
| 180801 | 0 | 86592 | 0 |
| **1862 All Other** | **1890 All Other** | **1862 All Other** | **1890 All Other** |
| 191004 | 0 | 3645 | 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**

- Adults
- Age 19 - 24 Young Adult
- Age 25 - 60 Adult
- Agriculture/Natural Resources: Watershed Based Organizations
- Agriculture: Service Providers
- Communities: Cities and Towns
- Communities: Educators
- Communities: Local Officials/Leaders
- Communities: Schools
- Community leaders and citizens
- Environmental Professionals: Environmental Managers
- Public: College Students
- Public: Families
- Public: General
- Public: Homeowners
- Public: Master Gardeners
- Public: Small Business Owners/Entreprenuers
- Age 13 - 18 Youth
- Age 8 - 18 Youth
- Public: Age 13-18 (Youth)
- Train-the-Trainer recipients:youth
- Youth

**3. How was eXtension used?**

eXtension was not used in this program

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

**1. Standard output measures**

| 2012 | Direct Contacts Adults | Indirect Contacts Adults | Direct Contacts Youth | Indirect Contacts Youth |
|---|---|---|---|---|
| **Actual** | 1872 | 80600 | 1583 | 0 |

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

**Patent Applications Submitted**

| | |
|---|---|
| Year: | 2012 |
| Actual: | 0 |

**Patents listed**

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

**Number of Peer Reviewed Publications**

| 2012 | Extension | Research | Total |
|---|---|---|---|
| Actual | 0 | 2 | 2 |

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

**Output Target**

**Output #1**

**Output Measure**

- Consultation

| Year | Actual |
|---|---|
| 2012 | 16 |

**Output #2**

**Output Measure**

- Demonstration

| Year | Actual |
|---|---|
| 2012 | 3 |

**Output #3**

**Output Measure**

- Field day/Fair

| Year | Actual |
|---|---|
| 2012 | 1 |

**Output #4**

**Output Measure**

- Presentation

| Year | Actual |
|---|---|

| | |
|---|---|
| 2012 | 28 |

**Output #5**

**Output Measure**

- Fact Sheet

| Year | Actual |
|---|---|
| 2012 | 8 |

**Output #6**

**Output Measure**

- Tour

| Year | Actual |
|---|---|
| 2012 | 2 |

**Output #7**

**Output Measure**

- Train the Trainer

| Year | Actual |
|---|---|
| 2012 | 8 |

**Output #8**

**Output Measure**

- Web page updating

| Year | Actual |
|---|---|
| 2012 | 10 |

**Output #9**

**Output Measure**

- Workshop series

| Year | Actual |
|---|---|
| 2012 | 28 |

**Output #10**

**Output Measure**

- Workshop - single session

| Year | Actual |
|---|---|
| 2012 | 20 |

**Output #11**

**Output Measure**

- Display

| Year | Actual |
|---|---|
| 2012 | 5 |

**Output #12**

**Output Measure**

- Research

| Year | Actual |
|---|---|
| 2012 | 3 |

### V(G). State Defined Outcomes

## V. State Defined Outcomes Table of Content

| O. No. | OUTCOME NAME |
|---|---|
| 1 | Number of educators increasing knowledge of watersheds and new teaching tools and techniques |
| 2 | Number of lakeshore residential properties planting buffer strips or maintaining native vegetation as a buffer to decrease erosion and sedimentation |
| 3 | Number of middle and high school youth demonstrating an increase in knowledge of watersheds and their role as watershed stewards |
| 4 | Number of municipal officials have an increased understanding of and need for natural resource based planning and stormwater management at the municipal level |
| 5 | Number of municipalities integrating natural resource protection and Low Impact Development strategies in town plans and ordinances |
| 6 | Number of properties under one or more low input/ no phosphorous lawn care practices |
| 7 | Number of participant hours restoring riparian habitat through stewardship activities. |
| 8 | Number of residencial households adopting low input/no phosphorous lawn care practices |
| 9 | Number of retail lawn and garden centers providing information on low input/no phosphorous lawn care options to customers |
| 10 | Number of schools that demonstrate an increase in, or institutionalization of, integrated watershed education into returning educators curriculum |
| 11 | Number of service learning high school or undergraduate college students conducting or participating in watershed stewardship projects |
| 12 | Number of sites where Low Impact Development practices are being used to decrease stormwater runoff |
| 13 | Number of towns/municipalities and watershed organizations conducting outreach activities and participating in outcome oriented water quality education |
| 14 | Number of On-Farm Climate Change Adaptation and Mitigation Best Practices in the Lake Champlain Basin of Vermont. |

**Outcome #1**

**1. Outcome Measures**

Number of educators increasing knowledge of watersheds and new teaching tools and techniques

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

| Year | Actual |
|---|---|
| 2012 | 76 |

**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 #2**

**1. Outcome Measures**

Number of lakeshore residential properties planting buffer strips or maintaining native vegetation as a buffer to decrease erosion and sedimentation

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

| Year | Actual |
|---|---|
| 2012 | 27 |

**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 #3**

**1. Outcome Measures**

Number of middle and high school youth demonstrating an increase in knowledge of watersheds and their role as watershed stewards

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

| Year | Actual |
|---|---|
| 2012 | 650 |

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

**Issue (Who cares and Why)**
As Vermont begins to experience frequent storm events and droughts in the summer it becomes more important that teachers and students are educated about the difference between weather,

climate, climate change and climate science.

**What has been done**
UVM Watershed Alliance is a partner of CBEI, Champlain Basin Education Initiative, a consortium of environmental and place-based education groups. CBEI partners coordinate professional development workshops for educators. Educators learn the technology and tools to teach climate science and climate change. 76 educators, some returning, overwhelmingly responded positively about the training. One saying, "..useful information, stimulus for exciting educational opportunities for the classroom."

**Results**
This year approximately 650 students demonstrated knowledge of watersheds and their role as watershed stewards, many participating in restoration projects. Vermont has the ability to adapt to changes in our landscape if future generations have the knowledge and understand what needs to be done. For more information about Climate Change Resources - http://watershedmatters.edublogs.org/files/2012/03/Climate-Change-Resources-for-Teachers-2fedhpe.docx

**4. Associated Knowledge Areas**

| KA Code | Knowledge Area |
|---|---|
| 112 | Watershed Protection and Management |

**Outcome #4**

**1. Outcome Measures**

Number of municipal officials have an increased understanding of and need for natural resource based planning and stormwater management at the municipal level

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

| Year | Actual |
|---|---|
| 2012 | 26 |

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

**Issue (Who cares and Why)**
Improperly managed storm water can lead to erosion and sedimentation, increased pollutant loads, and compromises to aquatic habitat. In Vermont, at least seventeen waters are listed as impaired due to storm water with the majority of these being located in the Lake Champlain Basin.

**What has been done**
The Green Infrastructure Roundtable, a collaboration of over ten organizations and agencies, developed a strategic plan and Executive Summary. Lake Champlain Sea Grant has been a participant in the Green Infrastructure Roundtable for the past two years.

**Results**
Based on the roundtable's strategic plan and executive order, on March 7th, Governor Shumlin signed the Green Infrastructure Executive Order, establishing an Inter-agency Green Infrastructure Council. The Council includes the Secretaries of Natural Resources, Transportation and Commerce, and the Commissioner of the Department of Buildings and General Services or their designee. It is charged with supporting the research, development, funding, integration and monitoring of green infrastructure projects throughout the state. This state level, inter-agency body will influence the storm-water management and other threats to the Lake Champlain Basin.

**4. Associated Knowledge Areas**

| KA Code | Knowledge Area |
|---|---|
| 112 | Watershed Protection and Management |

**Outcome #5**

**1. Outcome Measures**

Number of municipalities integrating natural resource protection and Low Impact Development strategies in town plans and ordinances

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

| Year | Actual |
|---|---|
| 2012 | 2 |

**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 #6**

**1. Outcome Measures**

Number of properties under one or more low input/ no phosphorous lawn care practices

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

| Year | Actual |
|---|---|
| 2012 | 6 |

**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 #7**

**1. Outcome Measures**

Number of participant hours restoring riparian habitat through stewardship activities.

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

| Year | Actual |
|---|---|
| 2012 | 260 |

**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 #8**

**1. Outcome Measures**

Number of residencial households adopting low input/no phosphorous lawn care practices

Not Reporting on this Outcome Measure

**Outcome #9**

**1. Outcome Measures**

Number of retail lawn and garden centers providing information on low input/no phosphorous lawn care options to customers

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

| Year | Actual |
|---|---|
| 2012 | 158 |

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

**Issue (Who cares and Why)**
Phosphorus is one of the leading contributors to toxic blue-green algae blooms in Lake Champlain, affecting water quality, lake tourism and recreation and public health. A major source of phosphorous input to the lake is via urban storm-water, and overuse or misapplication of phosphorous fertilizer.

**What has been done**
Lake Champlain Sea Grant is a founding member of the Green Lawn Coalition. The Coalition organized the "Don't P on your lawn" campaign used to dissuade homeowners from using phosphorous fertilizers on their lawns. This campaign inspired a legislative act.

**Results**
A legislative act (Title 10, Chapter 47, Section 1266b) passed in 2011, which took effect Jan. 1, 2012, outlawed the application of phosphorus fertilizers on lawns, with a few exceptions. In 2007 161.2 tons of phosphorous, contained in domestic lawn care products, was sold in Vermont. Eliminating overuse will reduce phosphorous use by at least 75%, removing over 120 Tons of phosphorous from Vermont watersheds (based on 2007 state-wide application data).

**4. Associated Knowledge Areas**

| KA Code | Knowledge Area |
|---|---|
| 112 | Watershed Protection and Management |

**<u>Outcome #10</u>**

**1. Outcome Measures**

Number of schools that demonstrate an increase in, or institutionalization of, integrated watershed education into returning educators curriculum

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

| Year | Actual |
|---|---|
| 2012 | 5 |

**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 service learning high school or undergraduate college students conducting or participating in watershed stewardship projects

Not Reporting on this Outcome Measure

**Outcome #12**

**1. Outcome Measures**

Number of sites where Low Impact Development practices are being used to decrease stormwater runoff

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

### 3b. Quantitative Outcome

| Year | Actual |
|---|---|
| 2012 | 2 |

### 3c. Qualitative Outcome or Impact Statement

**Issue (Who cares and Why)**
Advances have been made in methods of treating storm-water pollution; it remains the fastest growing threat to Vermont's water quality. Rain and snow melt pick up sediment that can impair surface waters. Rain gardens and buffer strips provide one simple solution to manage runoff onsite.

**What has been done**
Sea Grant staff worked with two communities to address runoff providing on-site guidance and technical assistance building 5 roadside rain gardens in one community and the other a infiltration trench and rain garden addressing runoff from an impervious tennis court surface.

**Results**
The community with the 5 roadside rain gardens had 8.49 inches of rain last year and treated 25,308 square feet of impervious surface. This displaced 120,379 gallons of storm water. The tennis court produces 7,200 gallons of water in every one-inch rain event.

### 4. Associated Knowledge Areas

| KA Code | Knowledge Area |
|---|---|
| 112 | Watershed Protection and Management |

## Outcome #13

### 1. Outcome Measures

Number of towns/municipalities and watershed organizations conducting outreach activities and participating in outcome oriented water quality education

Not Reporting on this Outcome Measure

## Outcome #14

### 1. Outcome Measures

Number of On-Farm Climate Change Adaptation and Mitigation Best Practices in the Lake Champlain Basin of Vermont.

Not Reporting on this Outcome Measure

## 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 (techology limitations in areas)

### Brief Explanation

{No Data Entered}

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

### Evaluation Results

Outcome measures in this report outline mid-level changes occurring due to the latest research and education in the field. Staff are employing varying techniques to gather data post-event to determine changes made.

Narratives with the outcome measures highlight some of those results and explain the value of those changes.

Stakeholder input continues to inform program efforts direction and content, format and accessibility.

### Key Items of Evaluation