

V(A). Planned Program (Summary)

Program # 2

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	10%		10%	
104	Protect Soil from Harmful Effects of Natural Elements	5%		5%	
111	Conservation and Efficient Use of Water	5%		5%	
112	Watershed Protection and Management	25%		15%	
123	Management and Sustainability of Forest Resources	0%		10%	
124	Urban Forestry	5%		5%	
125	Agroforestry	5%		5%	
131	Alternative Uses of Land	5%		5%	
132	Weather and Climate	5%		5%	
135	Aquatic and Terrestrial Wildlife	0%		5%	
136	Conservation of Biological Diversity	0%		5%	
205	Plant Management Systems	0%		5%	
216	Integrated Pest Management Systems	5%		5%	
605	Natural Resource and Environmental Economics	0%		5%	
608	Community Resource Planning and Development	15%		5%	
903	Communication, Education, and Information Delivery	15%		5%	
	Total	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	18.0	0.0	12.0	0.0

Actual Paid Professional	3.9	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
329391	0	226999	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
329391	0	226999	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
733928	0	1056251	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The broad emphasis of climate change is to address critical environmental priorities that contribute to improved air, soil, and water quality; fish and wildlife management; and enhanced aquatic, terrestrial, and coastal ecosystems.

Our programs are strongly focused on the use of geospatial technologies to promote smart growth while conserving the natural resource base. Programs provide research-based training for municipal officials that incorporate geospatial technologies allowing them to better manage existing natural resources. Recently we have focused on water resource management. Connecticut is a water-rich state. However, local development can create substantial pressure on and competition for water resources. By linking water resource planning and land use planning, we promote sustainable development.

In Connecticut, the green industry accounts for approximately two billion dollars of the state economy each year. UConn is focused on developing new tools and technologies that promote safe and healthy green spaces across the state. Research and extension programs focus on Integrated Pest Management (IPM) approaches for schools and other municipal areas. Programs also address tools and techniques for groundskeepers to improve management of inputs on recreational areas and for homeowners to achieve healthy, sustainable lawns and landscapes.

Activities in this planned program include:

- Training conferences for municipal officials and volunteers (e.g., Land Use Academy, GIS, town tree wardens,)
- Public workshops and train-the-trainer sessions
- Master Gardener support and training
- Connecticut Environmental Action Day for high school students
- Fact sheets, web pages, and general media
- Continued research and development of computer-based technologies such as video programs, webinars and possibly phone apps.
- Basic and applied research projects.

2. Brief description of the target audience

Elected municipal officials, municipal staff and volunteers, citizens, Soil Science Society of America, research scientist in the environment field of study, arborists, urban forest managers, silviculture foresters, New England fisheries stakeholders, fisheries managers, conservation biologist and forest land owners.

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	10500	25000	750	1000

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

Patent Applications Submitted

Year: 2013

Actual: 1

Patents listed

Methods to produce animal browsing resistant plants

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	17	11	28

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Face to face general group education sessions (workshops, etc.)

Year	Actual
2013	199

Output #2

Output Measure

- New or updated web page(s)
Not reporting on this Output for this Annual Report

Output #3

Output Measure

- Training conferences or sessions hosted or conducted.
Not reporting on this Output for this Annual Report

Output #4

Output Measure

- Fact sheets, bulletins and newsletters written or edited.

Year	Actual
2013	29

Output #5

Output Measure

- Training undergraduate and graduate students and Post Doctoral Researchers

Year	Actual
2013	45

Output #6

Output Measure

- Number of individual consultations (in person, via e-mail, etc.)

Year	Actual
2013	169

Output #7

Output Measure

- Formal Extension outreach programs

Year	Actual
2013	77

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Development of new knowledge and technologies
2	Enhance adaptive capacity to climate change
3	Improve climate mitigation strategies and their adoption
4	Development of new knowledge on land use
5	Increase knowledge on the use of geospatial technologies

Outcome #1

1. Outcome Measures

Development of new knowledge and technologies

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Enhance adaptive capacity to climate change

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Improve climate mitigation strategies and their adoption

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	274

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

With 1000 miles of coastal shoreline, CT waterways are heavily impacted by coastal development. Polluted runoff is one of the primary sources of nitrogen pollution to Long Island Sound. Residents can help mitigate impacts to waterways by establishing and maintaining riparian buffers; the site of an intersection between a natural system and a human-based system that slow runoff from precipitation, aid in flood control, and filter or trap pollutants. Vegetated corridors are also reduce the impacts of waves and overwash on properties.

What has been done

We developed a web-based Coastal Riparian Landscaping Guide for Long Island Sound which tool includes a series of fact sheets describing the functions and values of coastal riparian corridors, how to prepare an area for planting, and how to plant. A listing of native plants is provided, with indications of their ability to withstand salt spray and inundation. A series of landscaping diagrams including both plan views and cross sections are provided. We also created "Buffer in a Bag" with 20 plants for \$40 and fact sheets on how and where to plant.

Results

We developed one web-based tool, worked with seven towns, and presented workshops to 274 people. These activities included planting riparian buffers at Lake Hayward in East Haddam and on the Niantic River in Niantic. Presentations on riparian buffers were given in the towns of Bridgeport, Monroe, Trumbull and Groton. Another presentation was given as part of the curriculum for the Advanced Master Gardeners - Sea Grant Coastal Certificate program. We also supported the development of a riparian buffer planting plan for a small pond in Lebanon.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
104	Protect Soil from Harmful Effects of Natural Elements
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
123	Management and Sustainability of Forest Resources
124	Urban Forestry
125	Agroforestry
131	Alternative Uses of Land
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135	Aquatic and Terrestrial Wildlife
136	Conservation of Biological Diversity
205	Plant Management Systems
216	Integrated Pest Management Systems
605	Natural Resource and Environmental Economics
608	Community Resource Planning and Development

Outcome #4

1. Outcome Measures

Development of new knowledge on land use

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	2923

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Connecticut, like many states in the Northeast, is a patchwork of rural, urban and transitional landscapes. Land use and the health of water resources are interconnected, and land use in Connecticut is determined at the local (municipal) level, by volunteer commissioners on planning, zoning, conservation and wetlands boards. In order to protect and improve the health of critical natural resources such as water, prime agricultural land and areas of wildlife diversity, local land use planners and board members must be educated on the links between land use and natural resources, and provided with information and resources to help them better determine and govern the future landscapes of their towns.

What has been done

The Center for Land Use Education and Research (CLEAR) has two major (and collaborating) programs on these issues, one focusing on land use planning and the other on water resource protection. The programs are: the Nonpoint Education for Municipal Officials (NEMO) and the Connecticut Land Use Academy. NEMO delivers educational workshops for local officials, conducts 2-day Rain Garden trainings, and continued its leadership role in tracking GI practices on campus. The Land Use Academy conducts regular full-day trainings for land use commissions.

Results

- 6 municipalities changed their plans and/or regulations to promote green infrastructure.
- A survey of CLEAR clientele on the use of CLEAR information and programs, 238 respondents from 87 towns and 25 regional or state organizations, showed that: 70% used CLEAR information to educate themselves, 50% to educate others; 57% to inform local land use decisions, and 56% to conduct analysis or research.
- The UConn Rain Garden App was downloaded 2,537 times in this time period.
- 9 new green infrastructure practices were installed on the UConn campus.
- UConn green infrastructure practices have cumulatively disconnected about 10 acres of impervious cover and reduced runoff to Eagleville Brook by about 38 million gallons to date.
- Land Use Academy graduates have come from 148 of the state's 169 municipalities.
- Of the over 100 Land Use Academy attendees providing evaluation feedback during this period, 100% said they would recommend the training to their fellow commissioners.

4. Associated Knowledge Areas

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605	Natural Resource and Environmental Economics
608	Community Resource Planning and Development

Outcome #5

1. Outcome Measures

Increase knowledge on the use of geospatial technologies

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	225

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In order to study, protect and manage natural resources, all sectors of society -- from private individuals and producers to private sector firms to communities to governmental agencies must have access to digital geographically-referenced (geospatial) information, and the ability to use it. There is a need in the state for training on the use of geospatial technologies such as geographic information systems (GIS), global positioning systems (GPS) and remote sensing. In addition, recent advances in geospatial technology now make it possible for non-technical audiences to access and use this information through the use of interactive mapping websites, but training is

needed to unlock this potential.

What has been done

The Geospatial Training Program (GTP) conducted training in: Basic GIS, GPS, Internet Mapping, and special advanced courses on varying topics: three 3-day GIS courses, four two-day GPS courses, one 1-day internet mapping course and two 1-day special topics courses were taught. GTP conducted internet mapping training within the USDA/NIFA Water Program network; three one-day workshops and one workshop at the National Land/Water Conference were held during this period. GTP also develops and maintains web mapping tools. GTP also worked with CT SeaGrant to create the Shellfisheries Mapping Atlas for non-technical citizens.

Results

Over 150 individual were trained in the use of GIS and GPS. Post-workshop surveys indicated that 90% were planning on putting their new expertise to immediate use in their jobs/businesses. 75 faculty and staff involved in the USDA/NIFA Water Program were trained in the creation of online maps to depict their research results and outreach programs; this is a five-year projects and evaluation is ongoing.

The CT ECO website was visited over 44,000 times by over 25,000 unique individuals, with an average stay of just under 3 minutes. This represents over 85 24-hour days of time that the CT ECO website was in use providing maps, data, and other natural resource-related information to CT citizens.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
132	Weather and Climate
605	Natural Resource and Environmental Economics
608	Community Resource Planning and Development
903	Communication, Education, and Information Delivery

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

These results are from the CLEAR Land Use and Water Program:

NEMO town programs and trainings conduct pre and post workshop surveys. Long term outcomes are tracked via phone interviews that provide "case study" examples of changes to land use practices, plans and regulations, which typically take multiple years to come to fruition. Technical tool use, such as the rain garden app, are tracked by web statistics, and feedback is received directly from individual users through a Feedback function of the app. Land Use Academy trainings use pre and post training surveys, which are distributed both at the workshops and available on a survey website. The impact of GI practices on the UConn campus are tracked through a unique system devised by NEMO staff that combines daily rainfall records with information on the design, specifications, and performance of each individual GI practice.

Key Items of Evaluation