

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

#### Program # 2

##### 1. Name of the Planned Program

Land Use and Water

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%	
103	Management of Saline and Sodic Soils and Salinity	0%		10%	
112	Watershed Protection and Management	25%		20%	
123	Management and Sustainability of Forest Resources	0%		10%	
124	Urban Forestry	5%		5%	
131	Alternative Uses of Land	5%		5%	
135	Aquatic and Terrestrial Wildlife	5%		5%	
136	Conservation of Biological Diversity	0%		5%	
205	Plant Management Systems	5%		5%	
216	Integrated Pest Management Systems	15%		15%	
605	Natural Resource and Environmental Economics	0%		5%	
608	Community Resource Planning and Development	15%		5%	
903	Communication, Education, and Information Delivery	15%		0%	
	<b>Total</b>	100%		100%	

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

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

Year: 2014	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	1.6	0.0	0.2	0.0
<b>Actual Paid</b>	1.9	0.0	0.2	0.0
<b>Actual Volunteer</b>	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
176768	0	164222	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
176768	0	164222	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
801780	0	1412243	0

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

**1. Brief description of the Activity**

The Land Use and Water planned program addressed critical environmental priorities that contribute to improved air, soil and water quality; fish and wildlife management; enhanced aquatic and other ecosystems. Programs are strongly focused on the use of geospatial technologies to promote smart growth while conserving the natural resource base. Programs provided research-based training to municipal officials that incorporate geospatial technologies allowing them to better manage existing natural resources.

Activities included:

- on-line material such as fact sheets, impact statements and new articles
- workshops and webinars
- YouTube videos, and mobile apps.
- trainings and individual counseling and assessments
- basic and applied research projects

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

Elected municipal officials; municipal land use staff and commissioners, researcher, city/town volunteers and citizens; state environmental and agriculture agency staff.

**3. How was eXtension used?**

eXtension was not used in this program

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

**1. Standard output measures**

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	5100	19900	325	3149

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

**Patent Applications Submitted**

Year: 2014  
 Actual: 0

**Patents listed**

None

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

**Number of Peer Reviewed Publications**

2014	Extension	Research	Total
<b>Actual</b>	2	46	48

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

**Output Target**

**Output #1**

**Output Measure**

- Conferences and Workshops, short courses, reports

Year	Actual
2014	152

**Output #2**

**Output Measure**

- New or updated web page(s)

Year	Actual
2014	4

**Output #3**

**Output Measure**

- Training undergraduate and graduate students and Post Doctoral Researchers

<b>Year</b>	<b>Actual</b>
2014	206

**Output #4**

**Output Measure**

- Webinars conducted

<b>Year</b>	<b>Actual</b>
2014	9

**Output #5**

**Output Measure**

- YouTube videos produced

<b>Year</b>	<b>Actual</b>
2014	4

**Output #6**

**Output Measure**

- Apps developed

<b>Year</b>	<b>Actual</b>
2014	1

**Output #7**

**Output Measure**

- Clinical, extension or other expert services

<b>Year</b>	<b>Actual</b>
2014	97

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

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

O. No.	OUTCOME NAME
1	Improve sustainable development practices in Connecticut
2	Develop plans and educate municipalities on adaptive responses to the impacts of climate change; floods, coastal protection, emergency response preparedness, coastal storms.
3	Mitigate stormwater runoff damage

## **Outcome #1**

### **1. Outcome Measures**

Improve sustainable development practices in Connecticut

### **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>
2014	300

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

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

In order for Connecticut communities, organizations, businesses and citizens to develop sustainable practices and protect natural resources, information on these resources must be made accessible and usable. In recognition of this fact, in 2010 UConn Extension and the CT Department of Energy and Environmental Protection (DEEP) partnered to create Connecticut Environmental Conditions Online, or CT ECO (<http://cteco.uconn.edu>.) CT ECO is an extensive internet mapping site, designed to be accessible to all visitors of the website, regardless of technical ability. Users can view and print maps from PDF files, use one of the several interactive online mapping applications, download data, or connect to spatial data from a desktop GIS program.

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

In 2014 CT ECO;

- Created a statewide, high resolution elevation (Lidar-based) dataset including elevation, slope, aspect, hillshade and shaded relief;
- Worked with an external researcher to create carbon sequestration maps showing the impact of deforestation on carbon storage in the state's forests;
- Presented at one international conference, one regional conference, and four statewide conferences
- Developed a new training course and conducted four training sessions attended by over 95 CT DEEP employees;
- Incorporated CT ECO training into the curriculum of the Natural Resources Conservation Academy, a CAHNR program for high school students.
- Incorporated CT ECO training into two Climate Adaptation Academy workshops on the use of

geospatial technology in storm readiness and response.

- Approximately 25,000 people visited the CT ECO site about 44,000 times.
- With an average visit duration of almost 3 minutes, 2013 usage was the equivalent to 255 work days spent using CT ECO by Connecticut communities, businesses, and individuals.
- Educated over 300 people on the development and capabilities of CT ECO.
- Conducted 2 CT ECO webinars reaching 266 people

### **Results**

CT ECO brings the power of GIS technology and the flexibility of internet technology together to "democratize" access to natural resource information in Connecticut. Individuals, agencies, organizations, communities and businesses can, for the first time, access the latest and best statewide geospatial information with no more technical training beyond how to operate an internet browser. The project team has been recognized for creating this combination of information and usability, and was awarded the Public Service Award in 2012 from the CT Chapter of the American Planning Association.

The use of CT ECO just before Tropical Storm Irene demonstrates the power of this type of accessible information. On August 25, 2011, three days before Irene passed through Connecticut, CLEAR sent out a message to its municipal and agency mailing lists calling their attention to the Storm Surge Modeling maps available on CT ECO. In the days to come, CT ECO received about twice as many visits as normal (about 400 per day), until the storm knocked out power to many areas.

## **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
112	Watershed Protection and Management
123	Management and Sustainability of Forest Resources
205	Plant Management Systems
605	Natural Resource and Environmental Economics
608	Community Resource Planning and Development
903	Communication, Education, and Information Delivery

### **Outcome #2**

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

Develop plans and educate municipalities on adaptive responses to the impacts of climate change; floods, coastal protection, emergency response preparedness, coastal storms.

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

- 1862 Extension

### 3a. Outcome Type:

Change in Knowledge Outcome Measure

### 3b. Quantitative Outcome

Year	Actual
2014	95

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

A number of severe storms in 2011 and 2012 caused significant economic and environmental harm to Connecticut municipalities, businesses and residences. After talking with local officials, residents, consultants and state officials, we discovered many complex and important climate related issues that will continue to challenge both coastal and inland communities over the next several decades.

#### What has been done

Extension Educators from Connecticut Sea Grant and the UConn Center for Land Use Education and Research (CLEAR) partnered with researchers, consultants and other professionals to work with municipalities on climate resiliency through a new Climate Adaptation Academy (CAA). CAA is designed to be a continuous process by which the complex and emerging climate adaptation issues facing municipalities are identified and innovative solutions are shared. CAA held 3 workshops, attended by 95 citizens, municipal officials, researchers, and outreach professionals.

#### Results

The first workshop provided a forum for an exchange of ideas and concerns about impacts of climate change and sea level rise on municipalities. A list of relevant topics to address in future CAA workshops was developed. In 2 additional workshops, State officials outlined the Connecticut Emergency Response and Long Term Recovery Program and explained how the state uses GIS to coordinate responses at the Emergency Operations Center. This led to a discussion of a communications gap between local and state emergency responders. Panels of municipal officials shared their experiences using technology to prepare for disasters, what worked and what obstacles they faced. This provided information and guidance for towns that need to build GIS capacity for emergency response.

## 4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
112	Watershed Protection and Management
605	Natural Resource and Environmental Economics
608	Community Resource Planning and Development
903	Communication, Education, and Information Delivery

### **Outcome #3**

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

Mitigate stormwater runoff damage

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

- 1862 Extension

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

Change in Action Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2014	444000

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

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

According to the EPA, stormwater runoff is the nation's leading source of water quality impairment. In urban areas like much of CT, runoff from extensive paved areas creates flooding and pollution problems. The challenge presented to UConn which mirrors many CT communities, is to protect local water resources while making use of new low impact development (LID) or green infrastructure (GI) practices. Quantifying the actual impact of these practices on local receiving waters is an important element for Clean Water Act regulatory compliance.

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

UConn Extension's NEMO (Nonpoint Education for Municipal Officials) Program, in collaboration with UConn Facilities, installed over 25 new LID/GI stormwater practices on campus since 2009. A unique tracking system was created to quantify the reductions in stormwater runoff achieved using green infrastructure practices on campus. These efforts contributed to UConn receiving the Sierra Club's #1 greenest universities ranking in 2013-2014.

##### **Results**

The NEMO tracking system had an immediate policy and economic impact on the University. The tracking system documented progress in reducing stormwater runoff, which is a requirement of the CT Department of Energy and Environmental Protection, regarding UConn's compliance with regulatory programs. To date, approximately 444,000 square feet of impervious surface has been disconnected from the stormwater system. A new Memorandum of Understanding (MOU) replaced the previous MOU that would have required a costly diversion of stormwater from one local drainage basin to another adjacent basin; thus, the tracking system enabled UConn to save approximately \$850,000. The MOU also serves to reinforce UConn's commitment to green infrastructure, which is prominently featured in the new Campus Master Plan written in 2014. A new group has been formed to plan and discuss GI options for future development on campus.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
131	Alternative Uses of Land
205	Plant Management Systems
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
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

##### Brief Explanation

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

##### Evaluation Results

The CAA is the only statewide educational forum on climate adaptation in Connecticut. CAA held workshops focused on technology and emergency response, and raised awareness among state and local officials that procedures need to be developed to improve communications and coordination of emergency response efforts. In addition, the Town of Greenwich subsequently purchased a weTable to use for adaptation planning purposes. Evaluation forms were available at each workshop. These post-workshop surveys sought the participant's evaluation of the workshop content and feedback on how the workshops can be improved, and requested input on future workshop topics. Current plans are for all CAA participants receive a follow-up email survey six to eight months later. Workshop feedback and outreach efforts will help identify new CAA topics, and prioritize research and extension needs.

##### Key Items of Evaluation

Connecticut Environmental Conditions Online, or CT ECO's (<http://cteco.uconn.edu>) mission is to encourage, support and promote informed land use, conservation and development decisions in Connecticut by providing local, state and federal agencies, and the general public with convenient access to the most up-to-date and complete natural resource information available statewide. CT ECO is now entering its 6<sup>th</sup> year of existence.

- CT ECO usage, and return usage, is a measure of impact. The number of unique individuals using CT ECO, and the number of total visits, has increased steadily. Of the almost 25,000 users in calendar year 2013, 46% were return users, and 54% new users.
- All Extension Geospatial Training Program training sessions include a participant survey and evaluation. For the CT DEEP trainings, 58 of the 97 participants responded. 100% said they would recommend the course to a colleague. 93% said they found the workshop either truly splendid or well worth it.
- In late 2012 CLEAR conducted a survey of Connecticut planners, agency staff, land use commissioners, and other clientele. There were 238 respondents representing 87 Connecticut towns, 10 other states, and 25 regional, state and federal organizations/agencies. In only its third year of existence, CT ECO was the CLEAR program with the greatest percentage of people reporting that they used it "regularly" or "all the time" (49%).