UCONN | COLLEGE OF AGRICULTURE, HEALTH AND NATURAL RESOURCES

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CLEAR

A Newsletter of the Center for Land Use Education and Research at the University of Connecticut.

Research

CLEAR's Land Cover Data Fuels Better Carbon Accounting

By Linda Powers Tomasso, Center for Health and the Global Environment, Harvard School of Public Health

Greenhouse gas (GHG) inventories estimate levels of emissions that are scientifically understood as the human-induced basis for climate change. GHG inventories resemble balance sheets indicating both emissions sources and carbon "sinks" that remove atmospheric CO_2 via long-term carbon storage in vegetation cover, soils, and forests. Like all New England states, Connecticut over the past decades has seen a loss of its beneficial carbon sinks due to land converted from forested and vegetated landscapes to areas of development, complicating state efforts to buffer its contribution to climate change.

To date, carbon sinks have been omitted from GHG inventories due to insufficient accounting methods, leading to an undervaluation of Connecticut's forests and open spaces as agents of regional climate stabilization. That situation, however, is changing. Linda Powers Tomasso explored

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Outreach

Climate Adaptation Academy Takes Connecticut by Storm

By Bruce Hyde, Land Use Extension Educator

Damage to the built and natural environment caused by recent storm events has raised our collective awareness of the impacts of climate change and the need to adapt as sea levels rise and storm surge levels increase. While the impacts of Tropical Storm Irene and Superstorm Sandy grab the headlines with dramatic pictures of flooding, collapsed houses and eroded shorelines, there are many complex and equally important climate related issues that will challenge both coastal and inland communities in the next several decades. Identifying these issues in the near term will help advance the effort to fully determine the magnitude of each, and begin to develop an adaptive response. This will be a long-term process that requires participation of a wide range of individuals, institutions and governmental agencies.

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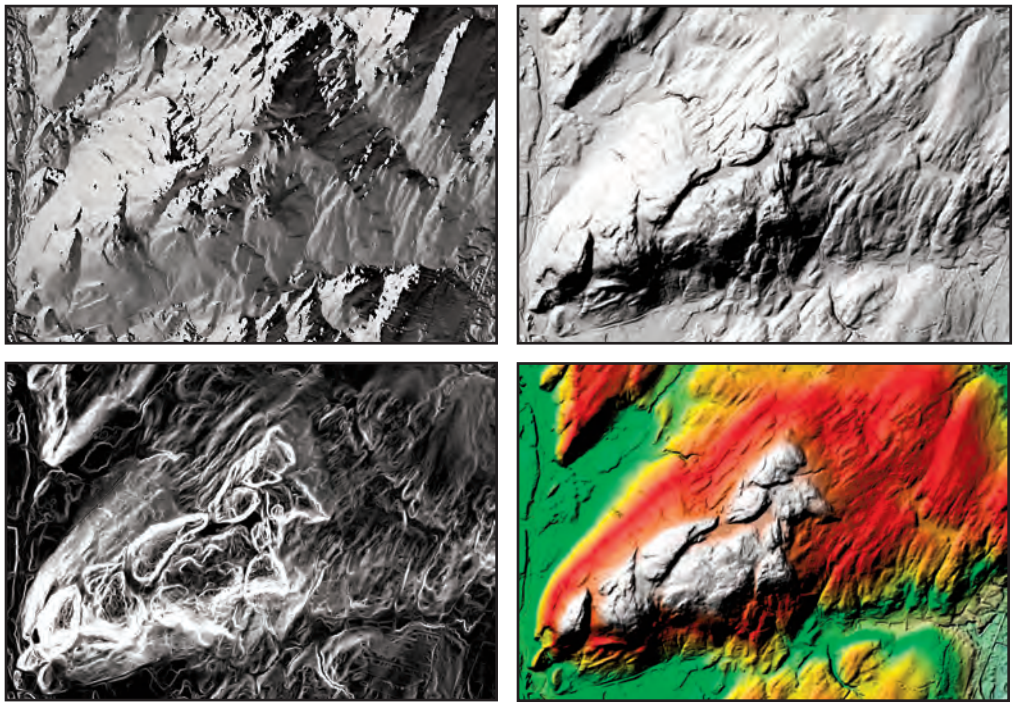
Participants of a climate change workshop tour a Connecticut beach effected by Storm Sandy.

Program Updates

▶ Mapping: Not Your Grandmother's Topo Map

The Connecticut Elevation Viewer, which is much cooler than it sounds, is now up and running on the CT ECO website (CLEAR/CT DEEP). We are going to go out on a limb and say that the Viewer is the first web tool in the country that makes Lidar data visually and interactively accessible in so many formats. Lidar, high resolution elevation data collected by a remote sensing technique that uses lasers, has a wide range of uses for research, engineering and management (many of which no doubt have yet to be discovered). **Contact Emily Wilson at emily.wilson@uconn.edu or 860-345-5226 for more information, or visit the CT ECO website at cteco.uconn.edu.** ●



(Clockwise from top left) aspect, hillshade, shaded relief, and slope maps of Sleeping Giant State Park in Hamden. Elevation (not shown) is also available on the Viewer.

▶ Education: The Natural Resources Conservation Academy, Three Years In

The Natural Resources Conservation Academy (NRCA) is a program that brings high school students from throughout Connecticut to the UConn campus for a week-long field experience that includes classroom instruction, field work and team exercises in a wide range of natural resource topics. NRCA is a program of the UConn Department of Natural Resources and the Environment, one of CLEAR's parent departments, and many of the modules are taught by CLEAR-related faculty. After three successful summers, the NRCA has "graduated" 68 students from 38 towns. Students are then tasked with going back to their communities and working with a local group(s) to conduct a conservation project. To date, 52 such projects are either completed or underway. We think it's safe to say that the NRCA is a huge success! Base funding for the NRCA comes from a private foundation. **For more information, contact NRCA Coordinator Laura Cisneros at laura.cisneros@uconn.edu, 860-486-4917, or visit the NRCA website at nrca.uconn.edu.** ●

(Top) Members of the NRCA Water Team, the Water Warriors, refurbish a rain garden on campus under the tutelage of CLEAR's Mike Dietz (not shown).

(Bottom) Emily Wilson of CLEAR (standing) helps students get their geospatial bearings on the first day of NRCA, July 2014.

▶ People: New Faces at CLEAR

Two recent additions to the ranks have appeared in the hallowed hallways of CLEAR.

Andrew Kinlock is a recent graduate of The George Washington University who comes to the Center from a position with the CT DEEP. Andrew is working with Cary Chadwick and Emily Wilson on a project to update Connecticut's piece of the USGS hydrography National Hydrography Dataset, which contains detailed geospatial information on the state's waterways and waterbodies. The bright and shiny new NHD will be posted on the CT ECO mapping website. Andrew is reportedly already seeing squiggly blue lines in his sleep.

Manon Lefevre is a recent graduate of Wesleyan University, and is working part-time for CLEAR on a variety of projects. After spending her first week trying (in vain) to get us to pronounce her name with the correct French accent, she has moved on to updating the information in the Connecticut LID Atlas, working with Dave Dickson and Mike Dietz. Manon will also be working with Juliana Barrett and Bruce Hyde on organizing upcoming Climate Adaptation Academy programs. For additional information on CLEAR faculty and staff, visit clear.uconn.edu/staff.htm. ●

Green Infrastructure

Bridgeport Green Infrastructure Project Gets Underway

A partnership consisting of CLEAR's NEMO Program, the UConn Natural Resources Conservation Academy (article left), Michael Singer Studio and the City of Bridgeport Office of Sustainability has embarked on a new project focused on building support for green infrastructure in Bridgeport's neighborhoods through implementing on-the-ground green infrastructure practices. The kick-off effort took place on November 8th, 2014 at Central High School, where community residents and Central High students participated in a half-day workshop that culminated in the construction of a 1,000 square foot rain garden at the school. More such workshops/installations are being planned for Spring of 2015.

For information contact Michael Dietz at michael.dietz@uconn.edu or 860-345-5225. ●

Students, community members and the project team install a large rain garden. The garden will treat runoff from a large portion (5,500 square feet) of Central High's back driveway and service area.

By the Numbers

68
students graduating from the Natural Resources Conservation Academy

38
towns represented by NRCA students

52
local conservation projects completed or underway by NRCA students

1,000
square feet of new Central High School rain garden in Bridgeport

1,033
million metric tons of CO_2 sequestered by Connecticut's forests in 2010

7
separate Lidar datasets stitched together to create the new statewide elevation viewer

7,622
individual image "tiles" making up the state Lidar data layer

1
new CLEAR offspring. Welcome Sullivan, son of Cary Chadwick & husband James

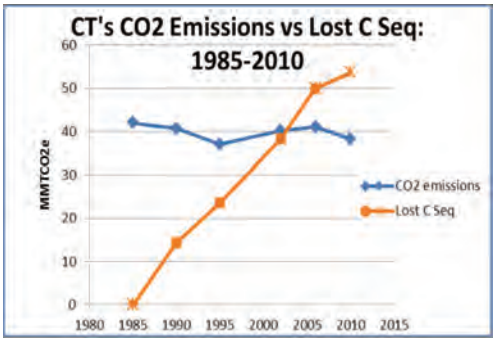
Research continued...

CLEAR's Land Cover Data Fuels Better Carbon Accounting continued from pg 1...

the problem of carbon sink accounting in her graduate thesis research at Harvard using CLEAR's twenty-five years of satellite derived land cover data. The study provides compelling, quantitative evidence of the important role that our state's forestlands play in the climate change arena. Using these data and financial records, she also looked at four open space preserves in Farmington, Connecticut to measure the cost-effectiveness of forest preservation as a carbon abatement tool. Here are just some of her major findings and conclusions:

- Lost forest cover from the 25 years (1985 to 2010) would today yield 54 million metric tons of CO_2 ($MMTCO_2$) in annual carbon capture.
- The ratio of lost forestland to lost carbon sequestration was estimated to be 4.6. In other words, the 3.8% of the state's acreage converted from forest to development during the 25-year study period reduced levels of carbon sequestration by an estimated 17.68%.
- Since about 2002, the amount of carbon sequestration lost through forest conversion has cumulatively totaled more than Connecticut's annual CO_2 emissions (graph).
- Financial analysis showed that permanent protection of forestland compares favorably to many other carbon abatement alternatives in a dollars per metric ton of CO_2 removed.

Contact Linda Powers Tomasso at lptomasso@comcast.net. Also check out the C-sequestration webinar on CLEAR's webinar page clear.uconn.edu/webinars. Learn more online at cteco.uconn.edu/energy/carbon. ●



The amount of carbon sequestration lost through forest conversion since 1985 now exceeds Connecticut's annual CO_2 emissions.

Outreach continued...

Climate Adaptation Academy Takes Connecticut by Storm continued from pg 1...

UConn's Climate Adaptation Academy is dedicated to facilitating this critical process.

The Climate Adaptation Academy, a partnership between Connecticut Sea Grant and CLEAR, is a sister program of CLEAR's highly successful Land Use Academy. However, while the Land Use Academy is built on the foundation of a regular curriculum, the Climate Adaptation Academy is seen as a constantly evolving discussion. Thus the Academy 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. An important component of all Academy sessions is an opportunity for participants to share the challenges they face and ways they have developed to adapt to the impacts of climate change.

Hurricane Irene and Sandy left their mark on Connecticut communities, as seen in this Connecticut coastal community. *Photos courtesy of the CT National Guard.*

After a kick-off session last spring devoted to big picture issues, Academy sessions to date have focused on stormwater flooding and the use of geospatial technology in municipal adaptation planning and storm response. Future sessions being planned will focus on a wide range of issues, including: shore protection and living shorelines; climate impacts on the real estate community; adaptation issues for businesses; legal issues; and climate impacts on the natural environment. **Contact Bruce Hyde at bruce.hyde@uconn.edu or 860-345-5229; or Juliana Barrett at juliana.barrett@uconn.edu or 860-405-9106. Visit the Climate Adaptation Academy website at clear.uconn.edu/climate.** ●

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The UConn Center for Land Use Education and Research (CLEAR) provides information, education and assistance to land use decision makers, in support of balancing growth and natural resource protection. CLEAR is a partnership of the Dept. of Extension and the Dept. of Natural Resources and the Environment at the College of Agriculture, Health and Natural Resources, and the Connecticut Sea Grant College Program. Support for CLEAR comes from UConn and from state and federal grants.

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