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CLEAR SCAPES



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

Outreach

Rain Garden Smartphone App Goes National

The popular NEMO Rain Garden smartphone “app” will now be expanded to cover at least a dozen more states around the nation, thanks to a grant from the USDA Water Program. The app, developed last year as a fun and portable helper for those wishing to build gardens that reduce runoff, elicited a number of enquiries from around the country, which ultimately resulted in the effort to obtain funding for a “national” version.

The creators of the app, CT NEMO Director Mike Dietz and National Programs Coordinator Dave Dickson, are already working with an advisory group of interested colleagues from other states on the collection of location-specific soil, plant,

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Adapting to Climate Change: CIRCA 2014

January saw the announcement of a new institute at UConn dedicated to providing answers and assistance to Connecticut communities as they strive to adapt to the impacts of climate change. The **Connecticut Institute for Resilience and Climate Adaptation**, or CIRCA, is a partnership of UConn and CT DEEP. The Institute was created by the state Legislature in direct response to a number of legislative fact-finding efforts initiated after the state was pummeled in recent years by Irene, Sandy, and the October ice storm.

CIRCA has three main (but overlapping) areas of applied research: environment, climate and coasts; energy and infrastructure, and; human dimensions (legal, social, financial). As noted, CIRCA also has a considerable emphasis on outreach to the state’s municipalities, and CLEAR is very much involved. While much of the research will come from Marine Sciences, Civil Engineering and the social sciences, the CIRCA outreach effort is largely based on expanding ongoing activities of CLEAR-

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Signs of recovery from Hurricane Sandy in the form of new construction, elevated to the new standards, are seen in Beach Haven, NJ. Photo by Liz Roll/FEMA



Program Updates

► CT ECO Helps to Organize Connecticut's High-Tech Elevation Data

Light Detection and Ranging, or Lidar, is a remote sensing technique that uses lasers to collect elevation data about the earth's surface. Lidar has a wide range of applications for natural resource management and engineering, but is increasingly being used in other disciplines like archeology. Connecticut is in the unique (and unenviable) situation that, instead of one seamless Lidar dataset, there are eight datasets that each cover parts of the state—and even then, not all of Connecticut is covered.

Thanks to a lot of hard work by CLEAR's Emily Wilson, this confusing patchwork of datasets is now explained in map and detailed form on the CT ECO Lidar help page. CT ECO is the **Connecticut Environmental Conditions Online** website, a partnership between the University of Connecticut CLEAR and the Connecticut Department of Energy and Environmental Protection (DEEP) to share Connecticut's natural resource geographic information with the public.



Lidar shaded relief of the Moodus, CT area (Salmon River on left). A portion of a terrain map is superimposed to highlight the fine detail of the lidar image.

The Lidar help page includes an interactive map with informational pop-ups and the ability to zoom in to a location and determine which data set or sets, if any, occur there. Also available are links to documents and metadata. Although this site will mostly be of help to GIS professionals, CT ECO

will soon be hosting map services of Lidar-derived maps (like hillshade, slope and aspect) that will be available in easy-to-use viewers designed for everyone.

Contact Emily Wilson at emily.wilson@uconn.edu or call 860-345-5226 for more information, or visit the CT ECO website at cteco.uconn.edu. ●

► New Law Mandates Tree Warden School for all Towns

The Connecticut tradition of tree wardens dates back well over a century, when in 1901 the Connecticut legislature passed a law mandating the appointment of a “tree warden” in all municipalities. Tree wardens are town officials that have care and control over all municipal and public trees and shrubs in a community. The 1901 law still guides the roles and responsibilities of the tree warden, but in 2013 the state legislature revised the law to require that each city and town appoint a “qualified” person. *Qualified*, in this case, means that the tree warden or deputy warden must either be a Connecticut Licensed Arborist, or have successfully

completed the Tree Warden School.

The Tree Warden School was created in 1998 by Bob Ricard of UConn Extension, in cooperation with the Tree Wardens’



Students participating in a tree risk assessment class at the Tree Warden School.

Association of Connecticut, Inc. Over 300 tree wardens, deputy tree wardens, community forestry volunteers, arborists, landscape architects, and elected and appointed officials have completed the program. Per the revisions to the state law, anyone who took the course during or prior to 2013 will be regarded as meeting the qualifications of the new law, but for those others there is Tree Warden School. Tree Warden School is conducted each fall, and we are proud to now have it under the CLEAR banner.

For information visit the **Tree Warden** section of the CLEAR website, or contact Robert Ricard at 860-570-9257 or email robert.ricard@uconn.edu. ●

► Nigerian Professors Take CLEAR GIS Course to Help Track Parasitic Disease

In December 2013 the Geospatial Training Program (GTP) was host to two researchers from the Nigerian Defense Academy (Nigeria's equivalent of West Point), who traveled 5200 miles from home to attend the GTP's 3-day *Introduction to GIS* training course. Dr. Maikaje, a specialist in protozoology, and Dr. Umar, who specializes in molecular parasitology, are conducting epidemiological studies about the incidence of trypanosomiasis, a parasitic disease more commonly known as 'sleeping sickness' that affects both animals and humans. They are also studying liver fluke, a parasite carried by



CLEAR's Cary Chadwick and Emily Wilson at their GIS class with Drs Maikaje and Umar.

snails that live in fresh water supplies frequented by cattle and other animals. They took the course to enable them to map field sampling stations and environmental factors in an attempt to decipher why different species of host snails are found in some areas and not others. We are happy to report that they did not freeze to death (although it was

close). In fact, they were model students, great guests, and are continuing correspondence with GTP's Cary Chadwick. **Contact Cary Chadwick at cary.chadwick@uconn.edu or call 860-345-5216 for more information about the Geospatial Training Program.** ●

LID on Campus As Green Infrastructure Blossoms on the UConn Campus, NEMO Keeps Track

In the last 5 years the main campus of UConn has become somewhat of a showcase for the innovative stormwater practices known as "low impact development" (LID) or "green infrastructure". These practices are designed to accept and infiltrate stormwater, thereby reducing the flooding, erosion, and water pollution frequently caused by runoff. The campus now sports green roofs, pervious asphalt parking lots, plazas and walkways made of pervious concrete pavers, and many vegetated depressions both large (called "bioretention") and small (called rain gardens).

During this same period, UConn has gotten very good at tracking its many green initiatives, culminating in the University being ranked #1 by the Sierra Club last year in a list of the ten most environmentally active schools in the country. But stormwater reduction is somewhat trickier to keep track of than, say, electrical or water usage, which are routinely metered. Enter Dr. Mike Dietz, Director of the CT NEMO Program, who has devised a system that combines technical information on each LID practice with daily rainfall data to derive cumulative estimates of both the amount of stormwater put back into the ground, and the area of impervious surfaces that

have been "disconnected" from directly draining into campus streams. The resultant spreadsheet is large enough to wallpaper your dining room with, but the output is in the form of just two numbers. What are they, you ask? See the *By the Numbers* box, right column, for the answers.

Our new "Do It Yourself IC-TMDL" website has a detailed photo gallery of LID throughout Connecticut, including the UConn campus, as well as a virtual tour of campus practices. Visit nemo.uconn.edu/ic-guide, and go to Step 3. ●



Students walk by a large bioretention basin behind Oak Hall, Storrs, CT.

By the Numbers

165

towns represented by people trained by the Geospatial Technology Program in the past 3 years (out of 169)

148

towns represented by people trained by the Land Use Academy in the past 3 years (out of 169)

21,528

different individuals visiting the CLEAR website in 2013

31,800

visits to the CLEAR website in 2013

24,762

different individuals visiting the CT ECO website in 2013

43,960

visits to the CT ECO website in 2013

39.9 million

gallons of stormwater treated by UConn LID practices through 2013

7.3 football fields

the area of impervious surfaces "disconnected" from campus streams by LID

Outreach continued...

Rain Garden Smartphone App Goes National continued from pg 1...

and rainfall information. With this in place, a smartphone user only has to let their phone's GPS do its thing to get rain garden guidance and information specific to his or her location.

In fact, the expansion of the app is already well underway. The latest version now reaches to the Mid-Atlantic coast, covering the states of New Jersey, Maryland and Delaware. The new version is a collaboration with Rutgers University Extension Water Program, the Maryland Department of Natural Resources, University of Maryland Sea Grant Extension, and University of Delaware Extension.

The grant will also fund a new app to grow the National NEMO Low Impact Development (LID) Atlas, an interactive web map with information on almost 1000 LID practices around the country. The app will allow users to upload information about a new green roof, pervious parking lot or rain garden (for example) directly from their phone to the Atlas, including pictures and locational information. Previously, entries could only be made



through a web form accessible to a comparatively short list of registered users, which included NEMO Network projects, several regions of the EPA, and some state agencies. "The Atlas is a great resource and we're hoping that the new Atlas App will create a burst of new entries. We're shooting for 10,000 – the more the better!" says Dave.

Learn about and download the Rain Garden App at s.uconn.edu/rgapp. Visit the National LID Atlas at lidmap.uconn.edu. ●



Hurricane Irene and Sandy left their mark on Connecticut communities, as seen in these photos. (Left to right) Irene floods tobacco fields in the Windsor Locks area; damaged homes along the East Haven shore; a coastal community after Sandy. Photos courtesy of the CT National Guard.

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related faculty in the Department of Extension and Connecticut Sea Grant. This includes Land Use Educator Bruce Hyde and Sea Grant Educator Juliana Barrett, who have been teaming up in recent years on projects focused on coastal communities impacted by Irene and Sandy. It also includes Joel Stocker, a CLEAR Geospatial Specialist who has been working with Sea Grant and CT DEEP to track changes in the Connecticut coastline over time. On the energy side of resiliency, Extension Professor Tom Worthley has been working with Civil Engineering and the Natural Resources and the Environment Department on *Stormwise* (stormwise.uconn.edu), a

new outreach program focused on improving the stability and resiliency of forest edges where they intersect power lines.

The first outreach program under the CIRCA umbrella, the **Climate Adaptation Academy**, a one-day workshop for local officials loosely patterned after CLEAR's long-running Land Use Academy, was held on May 3rd. Watch for a recap and reviews in future CLEAR publications, websites and blog. Visit the **Climate Adaptation Academy website at clear.uconn.edu/climate**. Contact **Juliana Barrett at juliana.barrett@uconn.edu or call 860-405-9106**. Visit the **CIRCA website at circa.uconn.edu**. ●

Contact CLEAR at: University of Connecticut, CES, 1066 Saybrook Road, P.O. Box 70, Haddam, CT 06438 • Phone: (860) 345-4511
• Email: clear@uconn.edu • Web: clear.uconn.edu
• Editor: Chet Arnold • Designer: Kara Bonsack

The University of Connecticut 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 Department of Extension and the Department of Natural Resources and the Environment at the College of Agriculture and Natural Resources, and the CT Sea Grant College Program. Support for CLEAR comes from the University of Connecticut and from state and federal grants.

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