In This Issue

CLEARSCAPES

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

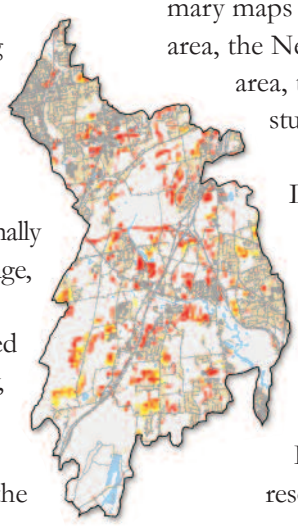
Research

What's CLEAR Land Cover Data Good for?

Changing Landscape (CL) Project and Remote Sensing Imagery

Late last Fall CLEAR unveiled the updated and expanded version of the ***Changing Landscape*** (CL) project, which uses remote sensing imagery to look at changes in our landscape over time. Formerly called "Connecticut's Changing Landscape," the project now includes the New York portions of the lower Long Island Sound watershed, and boasts a whopping (not to mention nationally unprecedented) 25 years of change, from 1985-2010.

The project update was funded by the Long Island Sound Study, which has been using CLEAR land cover data for some time to help track progress toward the Study's management goals. There are three types of information and sets of maps: (1) **basic land cover**, which shows changes to major categories like developed land, turf, forest and agricultural field (large image, page 2); (2) **riparian land cover**, which focuses on a corridor 300 feet to either side of all waterbodies and waterways (circle image, page 2), and; (3) **impervious cover**, which is estimated by watershed from the land cover using a model developed by CLEAR and the NOAA Coastal Services Center.



Land Change map for the Lower Mattabesset Basin. Red is new developed areas and yellow is new turf & grass between 1985 - 2010.

Information and maps are mostly organized by watershed, but there are also summary maps and data for the entire study area, the New York portion of the study area, the Connecticut portion of the study area, and all of Connecticut.

But do people use it? Changing Landscape data is in 30 meter pixels—squares roughly 100 feet on a side that tell us the *predominant* land cover within that square. In this world of GoogleMaps, GoogleEarth and Bing (not to mention CT ECO, see page 3), where high resolution imagery is at our fingertips 24/7, is 30m data really still relevant and useful?

In a word, YES. First of all, land cover data and imagery are not the same thing. We use land cover data for these reasons:

1 Because it enables us to look at large areas over long time periods.

2 Because we can quantify it, and thus say something meaningful about change

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Outreach

Build a Rain Garden with NEMO's New Smartphone App

The NEMO program has released UConn's first public smartphone application—the Rain Garden App. Landscapers, contractors, and homeowners can use the app to properly design, install, and maintain rain gardens, a low impact development practice.

A rain garden is a depression (about 6 inches deep) that collects storm water runoff from a roof, driveway, or other hard surface and allows it to infiltrate into the ground. They help protect the environment by preventing erosion, filtering runoff pollution, removing standing water, and creating a habitat for birds and butterflies. Rain gardens are also beautiful, often adding colorful landscaped areas to yards and office or school complexes.

In recent years, interest in rain gardens

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CLEAR Land Cover Data

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on the web at: clear.uconn.edu/projects/landscape

(quantifying high resolution imagery is still an evolving and expensive prospect).

3 Because it's a data set that tells us something quite unique. There is a growing body of literature that links land cover parameters like impervious cover, forest cover, and riparian area (streamside) cover to watershed and ecosystem health.

We developed our Changing Landscape project to provide useful research-based information for our many CLEAR land use outreach programs. Of course, we anticipated that others would use it too, which is why we put it up on the web and made it as easy as possible to access this information in multiple ways. Quite a few folks are taking advantage of that access, and using Changing Landscape (CL) information for a host of purposes. Here's a sampling:

- **Local Planning**: Landscape and landscape change information provides a unique way for a town to look at its current status and growth patterns. CL maps and data are a common component of municipal Plans of Conservation and Development.
- **State Regulation**: CL data on impervious surfaces was used by the CT DEEP to provide the foundation for their Impervious Cover TMDL water regulation for Eagleville Brook—the first of its kind in the nation. Similarly, CCL riparian land cover data was used by CT DEEP in the development of a statewide bacteria TMDL regulation.
- **Research and Education**: Faculty at UConn, Yale, Wesleyan, Trinity and other institutions of higher learning use CL information for research and/or as a teaching tool in classes related to landscape architecture, environmental studies, and geospatial science.
- **State Planning**: CL land cover data provide a key information layer for the new draft of the 2013-2018 Conservation and Development Policies Plan, currently under development by the CT Office of Policy and Management.
- **State Monitoring**: The CT Council on Environmental Quality, a watchdog and monitoring organization created by the Legislature, uses CL forest cover, forest fragmentation analysis and agricultural lands analyses to help track Connecticut's environmental progress.
- **Regional Environmental Assessment**: As noted, the federal/state partnership Long Island Sound Study funded CLEAR to expand the CL to include the Westchester County and Long Island portions of the Long Island Sound watershed. The project is meant to assist LISS researchers and managers to help track progress of several elements in its Comprehensive Conservation and Management Plan.
- **National Data Creation**: The NOAA Coastal Service Center used the CL website as the model for their Coastal Land Cover Atlas, a national web tool showing land cover change in all coastal states. As part of its creation, NOAA CSC also ran the CLEAR Forest Fragmentation model on its national coastal land cover dataset, and has made the resultant maps and data available interactively through the Atlas.
- **Private Sector Partnerships**: Placeways, Inc. incorporated the CLEAR Forest Fragmentation model into its popular CommunityViz© planning software, which is used by organizations all around the world.

We hope that our new 25-year dataset will find both new and returning users, who will devise hitherto unexplored ways to make use of land cover change data. So, we may be coarse here at CLEAR (at times), but at least we're useful!

Program Updates

▶ CLEAR's **Land Use Academy** has just completed a "Basic Training" workshop series in eastern Connecticut, in collaboration with **The Last Green Valley, Inc**. The Last Green Valley is a 35-town National Heritage Corridor, and a non-profit organization working to celebrate the area's heritage, conserve its natural resources, and respect its working lands.

The **Land Use Academy** and CLEAR partner **CT Sea Grant Program** have been teaming up with CT DEEP to develop **climate change adaptation information** and strategies for Connecticut's coastal towns.

For more information contact: Bruce Hyde, 860-345-5229, bruce.hyde@uconn.edu.

▶ The **CT ECO** natural resource internet mapping site, a collaboration of CLEAR and CT DEEP, has just added a **stunning new aerial photo set** to its every-growing collection. The new imagery is statewide, available in both color and infra-red (which highlights vegetation), and has a resolution of one foot!

For more information contact: Emily Wilson, 860-345-5226, emily.wilson@uconn.edu.

▶ The **CT NEMO** program is conducting a low impact development (LID) research and monitoring demonstration project looking at the **nitrogen removal capabilities of a new bioretention** cell on campus. The project is funded by the Long Island Sound Study. The Study is concerned about nonpoint source nitrogen additions to the Sound, which fuel algal blooms that cause low dissolved oxygen (hypoxia).

CT NEMO, in collaboration with Save the Sound/Connecticut Fund for the Environment, created a **new Rain Garden website** with information on the siting, sizing, construction, planting and maintenance of these small low impact development practices. The site complements the new **Rain Garden Smartphone App** (see front page).

For more information contact: Michael Dietz, 860-345-5225, michael.dietz@uconn.edu

CT NEMO's new Rain Garden website is a step-by-step "how to" design guide for CT and New England homeowners and communities.

▶ The **National NEMO Network** held its eighth national conference, **NEMO U8**, last fall in Duluth, MN. NEMO programs from 21 states attended the conference, where NEMOids from around the country swapped best outreach practices, education techniques and tools, and war stories about working with local land use officials.

The **National NEMO Network** is a partner organization of the upcoming 2013 **International Low Impact Development Symposium** in Saint Paul, MN. The conference is expected to attract over 1200 attendees, making it the biggest LID conference ever.

For more information contact: David Dickson, 860-345-5228, david.dickson@uconn.edu.

Awards

▶ The **CT ECO Team** from CLEAR and CT DEEP won the *2012 Public Service Award from the Connecticut Chapter of the American Planning Association*. Congratulations especially to the current team of Beth Doran from CT DEEP and **Cary Chadwick** and **Emily Wilson** from CLEAR.

▶ **Emily Wilson** was one of 53 finalists selected for the *2012 Connecticut Women of Innovation* awards. The awards program, sponsored by the Connecticut Technology Council, recognizes women in the workforce and at the high school and college levels who are innovators, role models and leaders in the technology, science and engineering fields.

▶ **Mike Dietz** and **Chet Arnold** were the recipients of an *EPA Environmental Merit Award* from EPA Region 1 (New England).

▶ **Tom Worthley** received a 2012 Award for *Excellence in Land Conservation* from the Connecticut Land Conservation Council.

Thank you, CBA

CLEAR owes more than a few debts of gratitude to our many partners. This issue, we'd like to thank the Planning and Zoning Section of the CT Bar Association for their absolutely essential contributions to the Land Use Academy, particularly our regular Battery of Barristers: Ken Slater and Rich Roberts of Halloran and Sage, LLP, and Mark Branse of Branse, Willis and Knapp, LLC.

CLEAR Website

clear.uconn.edu

Follow CLEAR on Facebook and Twitter.

Outreach Continued...

The new FREE Rain Garden App is designed to help you properly install a rain garden at your home, office or job site. Scan the QR code (right) to go to the Apple App Store.

Rain Garden App continued from page 1

has grown rapidly. Towns have begun to encourage or require them for new developments to help meet water quality goals. Homeowners have begun to install them to add visual interest to their yard and contribute to a cleaner environment. Landscapers have begun to use rain gardens as a critical part of sustainable landscape design.

CT NEMO has been conducting workshops for landscapers, contractors, and others throughout the state on proper rain garden design and installation. The Rain Garden App was developed as a supplement to those workshops to reinforce workshop concepts in the field. However, the app also serves as a stand-alone guide to building a rain garden for those unable to attend a workshop.

The app includes sections on how to install a garden, a plant selector tool to identify native plants that are rain garden ready, maps and techniques for determining soils suitability, information on how to pick a location, and tools for determining the proper size of your garden. This information is available right down to the location of individual addresses, making planning specific to a plot of land, not just a general area. Landscapers will find the app particularly useful because the 'My Rain Garden' section actually allows users to design, organize, and store information about multiple gardens right in the app.

To download the app, search for "Rain Garden" in the Apple App Store. An Android version is in the works and will be available this spring. For those who have not yet jumped on the smartphone bandwagon, NEMO has also developed a rain garden website with much of the same information: nemo.uconn.edu/raingardens (see page 3).

The Rain Garden App was funded by a Climate Change Grant from CT Sea Grant and some funding from the U.S. Department of Agriculture.

CLEAR at 11 Years

Every 5.5 years or so (don't ask!) CLEAR issues a Progress Report in an attempt to summarize and characterize highlights of our work. Our second such report is now out! To be frank (and immodest), *we're* impressed, and we hope that you will be too.

CLEAR is smaller than it once was—there are about 8 full-time faculty and staff working on Center projects on a daily basis—but our small size has not prevented us from engaging in a long list of projects with an even longer list of partners. Nor have we slacked off on producing websites, web tools, publications, and now smartphone apps (front page). And of course we continue to pursue grants, which typically support about 70% of our work (with the remaining support coming from the College of Agriculture and Natural Resources and the CT Sea Grant Program). During the 2007 to 2012 time period, CLEAR faculty procured 70 grants totaling a little more than $5 million, with 76% of this total funding coming from federal sources.

The Progress Report, however, relegates the lists and statistics to the back. The body of the Report is given to short descriptions of key impacts made by our research, geospatial training and tools, and outreach education programs. Highlighted examples include the widespread use of our Changing Landscape land cover information (front page), the use of the CT ECO web mapping site during Tropical Storm Irene, CT NEMO's work on a national precedent setting water quality project on campus, and the statewide impact of the Land Use Academy, which has trained over 900 people from 149 of Connecticut's 169 municipalities.

The Progress Report is online at clear.uconn.edu/publications, and free hard copies can be had by a quick email to clear@uconn.edu.

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