Connecting CT’s changing landscape to local decision makers

Research, tools & training, outreach
RESEARCH

A focus on characterizing Connecticut landscapes and how they change over time.

- Lab for Earth Resource Information Systems
- Geospatial Technology Extension Program
- Connecticut NEMO Program
- National NEMO Network
- Green Valley Institute
- Land Use Planning Program
- Land Use Academy
- Extension Forestry Program
OUTREACH

Helping communities to conduct natural resource-based land use planning and design.

- Lab for Earth Resource Information Systems
- Geospatial Technology Extension Program
- Connecticut NEMO Program
- National NEMO Network
- Green Valley Institute
- Land Use Planning Program
- Land Use Academy
- Extension Forestry Program
TOOLS & TRAINING

Assisting decision makers with technical planning and analysis tools, and training on geospatial technologies.

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- Geospatial Technology Extension Program
- Connecticut NEMO Program
- National NEMO Network
- Green Valley Institute
- Land Use Planning Program
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Today’s Tour to include....

• CT’s Changing Landscape
• Online Community Resource Inventory
• LID Trifecta
• Various & Sundry
CT NEMO Director John Rozum emerges from an LID presentation in a Yurt
National NEMO Network
CLEAR’s theory of web info: access for all!
A slight caveat about your presenter:
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Connecticut’s Changing Landscape Version 2

1985 - 2006
Summary of Methods

- **Remote sensing** uses sensors onboard satellites to capture images.

- Satellite images are turned into **land cover maps** using computers and people.

- The satellite captures information in 100 ft by 100 ft squares or **pixels**, appropriate for town, regional or state level interpretations but not fine enough for site-level studies.
Land Cover vs Land Use

• **Land Cover:** Literally, what is covering the land (forest, wetland, pavement)

• **Land Use:** What is planned, practiced or permitted on a given area (commercial, residential, dedicated open space)
Land Cover Version 1 a Smash Hit!

- Over 700 organizations have downloaded the data.
- Your Town and Your Watershed together accounted for about 1560 pages viewed per month.

Connecticut’s Changing Landscape

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Statewide information, by Town

To see town names, values, and cover and more, visit the interactive map. For detailed information about each town, visit Your Town.

Percent Forest:
- 7% - 30%
- 31% - 40%
- 41% - 60%
- 61% - 75%
- 76% - 87%

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Greatest increase in development (acres)

Manchester: 1731 acres, 10%

2006
1985
Town information & maps

Change according to time period

No Change Classes
- Developed
- Turf & Grass
- Water
- Undeveloped

Change Classes from Undeveloped to:
- Developed 1985-1990
- Turf & Grass 1985-1990
- Developed 1990-1995
- Turf & Grass 1990-1995
- Developed 1995-2002
- Turf & Grass 1995-2002
- Developed 2002-2006
- Turf & Grass 2002-2006
Town information & maps

Change according to previous land cover

No Change Classes
- Developed/Turf & Grass
- Agriculture
- Water
- Undeveloped

Change Classes: Between 1985 and 2006, change to Developed or Turf & Grass
- Other Grasses
- Agriculture
- Forest or Wetland
- Barren
- Other Changes
Welcome to CCL’s Land Cover Change Website

The land cover change portion of Connecticut’s Changing Landscape provides basic information about the growth of developed land during the period 1985 to 2006. Five directly comparable land cover datasets, from 1985, 1990, 1995, 2002 and 2006, allow us to look at, and quantify, landscape change in our state.

Version 2 is here and includes:

- a new data: 2006
- a new class in all dates: Agricultural Field
- improvements to all classes in all dates! This means that previously released land cover (we call it version 1) cannot be compared to this land cover (version 2)

For further explanation, visit the FAQ "How is Version 2 land cover different from Version 1?"

How much have we developed, and at what rate? Browse this website to find out...
Demo #1

[Image of a diagram with various labeled parts, likely for educational purposes.]
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Community Resource Inventory
Natural resource-based planning

• Basis for most of CLEAR’s outreach programs

• “Conducting a Community Resource Inventory” since 1995

• There’s been an evolution in the past 10 years on the main impediment to doing an inventory
Demo #2

An Automatic Back Scratcher

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Top 4 reasons for not doing LID

1. Don’t know about it.
2. Not sure why, how, and IF it works.
3. Aren’t being forced to do it.
4. Don’t want to be the first to do something new (is anyone else doing it?)
Design considerations during review

One important note: *rain gardens are not water gardens!* The gardens are typically designed to infiltrate water very quickly: around 4-6 hours. This rapid infiltration will eliminate the chances of creating mosquito habitat. If an improperly installed rain garden is holding water for excessive periods of time after a storm, the installer should repair the problem. Compaction of the rain garden material and/or premature clogging through siltation of the infiltration surface will lead to excessive ponding.

Residential rain gardens are often sized to hold one inch of runoff in above-ground storage from the contributing impervious surface. This sizing method has two benefits: first, the garden will capture the dirtiest portion of the runoff, or the “first flush”. Second, in many parts of the country, the majority (around 90%) of storms are one inch or less in size. What this means is that sizing the garden to contain this volume of water will give the most benefit, without oversizing it to try to contain larger, more infrequent events that are a much smaller portion of the total yearly runoff volume.

Bioretention areas at larger commercial sites should be designed by an engineer. The Bioretention Manual referenced above contains guidance on this. Although bioretention areas at larger commercial sites should have engineered design, you can easily design and create a rain garden for your own home! A guide *for residential rain gardens in Connecticut* is available through the University of Connecticut extension. A manual from the Wisconsin DNR also provides thorough guidance.

For more information, visit the following sections of the CT Stormwater Quality Manual:

Chapter 4, Section 4.4.2
Chapter 11, Filtering Practices, P-4
Welcome to the Connecticut LID Town Regulation Inventory!

There are many ways to incorporate innovative stormwater management strategies and low impact development (LID) into local town regulations. This website allows you to explore some Connecticut town and city regulations that have introduced innovative solutions to stormwater management. The list of regulations is not meant to be exhaustive. Alternatively, it is meant to help stimulate ideas on how your town can adopt lower-impact practices that protect water resources.

Disclaimer:
The regulations featured on this site are examples only, not recommendations. These examples are not meant to provide legal guidance and no town should update a regulation without first consulting the town attorney. Each town should also consider their own natural resources and development strategies when updating town regulations, and no excerpt on this website should be considered without first referring to the whole text of the regulation.
Stormwater Trifecta: CT LID Inventory

Marriot Hotel Constructed Wetland

Location: 625 North Road, Groton, CT 06340
LID Practice: Stormwater Wetlands
Land Use Type: Civic/Public
Construction Date: during 2000
Project Summary: Constructed stormwater wetlands
Detailed Project Information:
- Click here for project details
Additional Resources:
- DB Engineers Website

Entered By: Connecticut NEMO
http://nemo.uconn.edu/

Last updated on 2009-03-06 12:12:20 by John Rozum
National LID Atlas
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Jordan Cove Website & CD


This website highlights the project's background, has detailed descriptions of the low impact development practices used, lists technical and non-technical results and shows interviews from various project participants.

Overview  Timeline  BMP Tour  Results  Testimonials  Photo Gallery

This project is partially funded by the CT DEP through a US EPA nonpoint source (NPS) grant under section 319 Clean Water Act.
Click here to see links for additional information about best management practices.

BMP Description

**Grassed swales** are another component of low impact development. Swales are designed to replace traditional curb and gutter stormwater collection systems. In the Jordan Cove Project, no curbs were installed in the low impact development section, so any stormwater runoff that did not sink into the pervious road was directed to the swale. In addition to providing an exit for large flows, the swales were designed to infiltrate water. The swales helped to maintain the predevelopment hydrology of the site.
Non-technical Results

LID Subdivision (Post-construction)

Construction | Post-construction

What happened in the LID subdivision after construction?

The stormwater runoff volume per unit area from the LID subdivision after construction was 42% less than what ran off the undeveloped site! Imagine that the runoff before construction is the small cylinder below (left). As a result of LID practices, the stormwater running off the site decreased to the size of the smaller cylinder!

LID runoff pre-construction.   LID runoff post-construction: A 42% decrease!

Although there was a large decrease in stormwater runoff, the amount of a couple of pollutants leaving the site did increase. Sediment and phosphorus export increased, due to some fertilization by homeowners in the grassed swales and possible grass clippings. However, the increase was much less than the increase in the traditional subdivision.
Technical Results
Post-construction Impacts on Water Quantity

Construction | Post-construction

After all of the impervious surfaces were installed and construction ceased in the Traditional subdivision, the volume, depth and peak discharge of stormwater leaving the site increased significantly (Figure 1). In contrast, after construction finished in the LID subdivision, stormwater runoff volume significantly decreased from pre-construction levels. These changes can also be seen in the hydrograph below (Figure 2), which is representative data from a single September storm.
NOTE: You need to have a copy of Flash Player installed on your computer to view these testimonials. See the About Website section if you need to download a copy of Flash Player.

Testimonials

Hear from some of the people who were instrumental in making the Jordan Cove project a success. Click on the photos (right) to hear them describe their involvement and give their assessments of the project.

John Alexopoulos  John Clausen  Melvile Cote Jr.  Don Gerwick

Karl Guillard  John Lombardi  Roger Nelson  Paul Stacey