



REDUCING RUNOFF

Concreteville, CT

March 10, 2004



“Reducing Runoff” is the most topically direct follow up to “Linking Land Use to Water Quality” (Basic NEMO). There is a good deal of overlap, but the major differences is that less time is spent on planning and zoning recommendations, with most of the show being devoted to site design considerations – what is now known as “low impact development.” There are quite a lot of slides (about 100), but it goes quickly because many of the slides are pictures of “green” BMPs like pervious alternative pavements, swales, green roofs, etc. This presentation has been perhaps the most requested NEMO module over the last 2-3 years. It is continually evolving, but mostly this takes the form of additional good photos and local examples.



REDUCING RUNOFF

Tonight's Agenda

- land use impacts on water quality
- a quick look at North Branford
- reducing the impacts of impervious surfaces on North Branford's waterways through:
 - Planning
 - Zoning
 - Site Design

Main chapters of the talk, which is about 100 slides (1 hour) long.



What is a Watershed?

Watersheds
come in a
variety of
sizes



A Watershed is an area of land
that drains to a single outlet.

Watershed, defined. GIS layers show watersheds of different orders and how they're "nested."

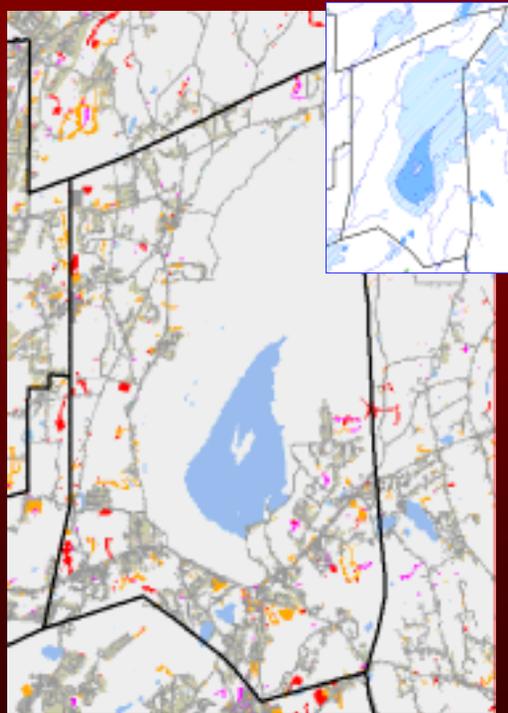


A Quick Look at Concreteville's

LAND COVER CHANGE

1985-2002

Change Classes	
Dark Grey	Developed prior to 1985
Light Green	Turf & grass prior to 1985
Yellow	Developed between 1985 - 1990
Orange	Turf & grass between 1985 - 1990
Pink	Developed between 1990 - 1995
Light Blue	Turf & grass between 1990 - 1995
Red	Developed between 1995 - 2002
Light Purple	Turf & grass between 1995 - 2002
White	Undeveloped
Blue	Water

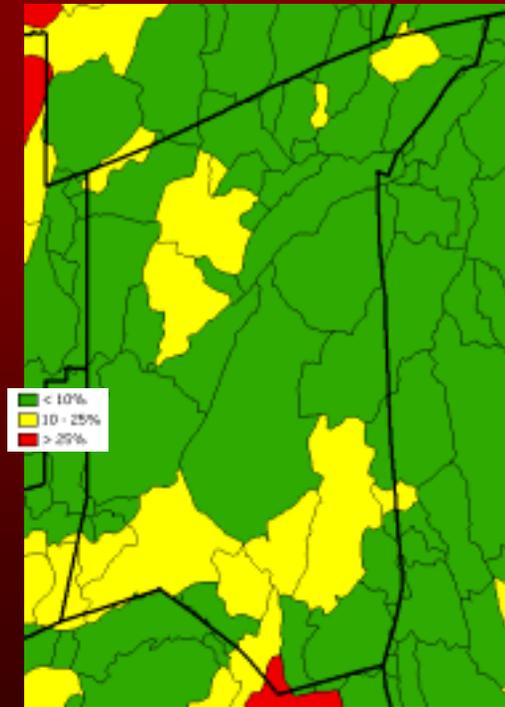
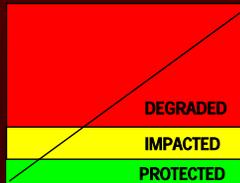


There is a short section in this talk that goes over some basic data layers for the town in question. This slide shows the results of CLEAR's 1985-2002 study of land cover change. Note the effect of water company land (inset) in preventing development in the northeast section of town.



A Quick Look at Concreteville's IMPERVIOUS COVER

Percent Impervious by
Local Watershed Basin



Latest % impervious cover (from CLEAR 2000 subpixel analysis) by local watershed. This leads into the true heart of the Reducing Runoff show.



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This abstract skips the brief planning and zoning sections. Most of the show focuses on site design – what is now known as “low impact development.”



Design Goal

Restore, Replicate the Natural
Landscape by Promoting Infiltration...

Principles to Guide Development:

Site Plan & Subdivision Guidelines

1. Preserve pre-development hydrologic conditions.
2. Minimize disturbance of natural grades and vegetation
3. Protect natural wetlands and stream buffers.
4. Maximize infiltration of stormwater
5. Minimize and disconnect impervious surfaces.
6. Phase Construction.

Reminds viewer that the design goal relates strongly to the watershed/water cycle information given in the intro section.



Alternative Design To Reduce Polluted Runoff

Roads

Build roads with minimum pavement width for projected traffic volume

Use road materials that decrease runoff

Install swales instead of curbs/drains to treat runoff



The presentation goes over each major portion of the impervious surface budget. Roads, for instance, are the largest component of %IS in residential areas. For each section, we try to cover reducing runoff through three strategies: (a) reducing the IS footprint; (b) reducing runoff by using pervious alternatives to pavement; (c) treating runoff with vegetated, infiltration-oriented systems.

Case Study

Glen Brook Green Subdivision, Waterford, CT



Lots of pictures in this presentation. Here's one from the Roads section showing pervious concrete pavers.

Engineered Swales

Roads

- Promote infiltration
- Most effective at sediment removal
- Open system easier to maintain & troubleshoot
- Installation costs comparable to piped drainage
- They look better!

Hebron, CT

Parking section: reduce footprint through parking utilization studies leading to fewer stalls built.

Parking Requirements

Parking

- **Are local standards excessive?**
Compare them to others (state/national)
- **Are required spaces actually being used?**
Conduct Parking Utilization Studies

**zoning often requires almost twice the number of stalls
actually used in peak periods!**

Parking section: reduce footprint through parking utilization studies leading to fewer stalls built.



Case Study

Parking

John Heinz National Wildlife Refuge at Tinicum, PA



From: Cahill
Associates

Photo of pervious asphalt.



Porous Concrete

Sidewalks

Porous concrete sidewalk at Penn State
University Visitor's Center



From: Cahill Associates

Photo of pervious concrete, from Sidewalks and Driveways portion of talk.



Photo of rain garden, from Roofs portion of talk.



Roofs



GREENGRID
The National Center for Green Roofs

"extensive" green roofs are
the new trend

Aerial of GreenGrid™ green roof designed for access and use. (August 2001)

An extensive green roof from Roofs section.



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For more information on this presentation or permission to use the entire presentation, contact the CT NEMO Program:

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