



Using NEMO to Advance Watershed Management

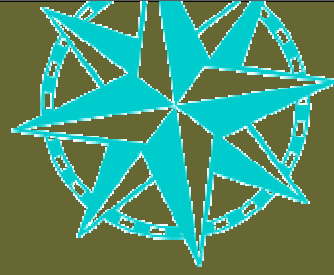
January 17, 2007

***A Watershed Academy Webcast
in Three Parts***



Webcast sponsored by EPA's Watershed Academy

The Cast



2

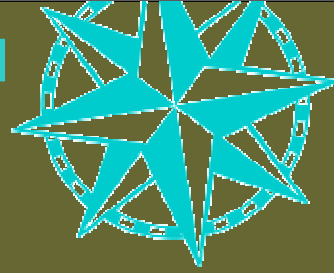
What We'll Cover



- **Brief & Painless Introduction**
- **NEMO Basics**
- **How is it Working?**
- **New & Noteworthy at NEMO**
- **The National NEMO Network**



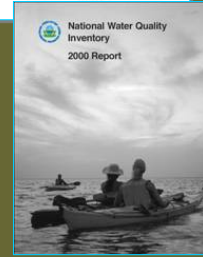
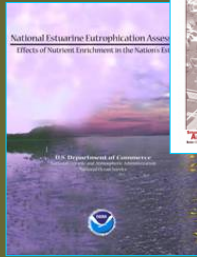
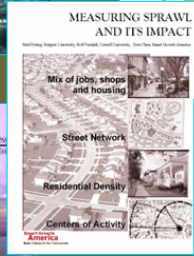
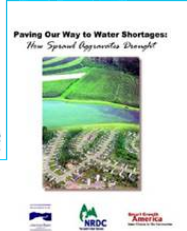
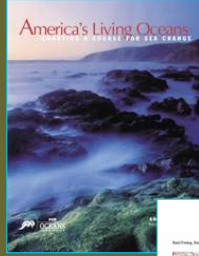
The Center for Land Use Education and Research

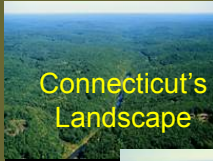
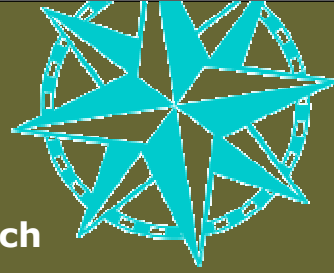


Provides information, education and assistance to land use decision makers, in support of balancing growth and natural resource protection.



Why Land Use?





1. Landscape research



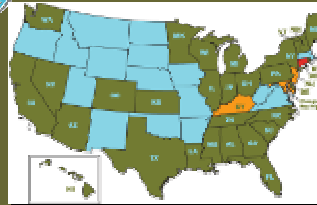
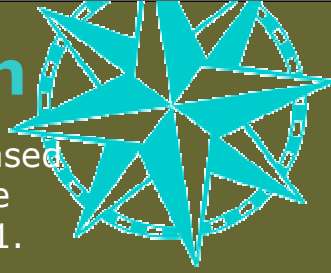
2. Tools & Training

3. Outreach Education



CLEAR's Foundation

A national award-winning research-based educational program for local land use decision makers, operating since 1991.



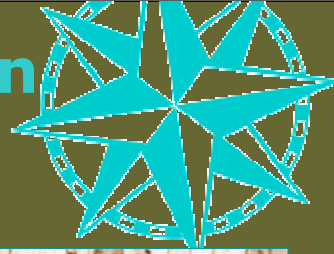
What We'll Cover



- **Brief & Painless Introduction**
- **NEMO Basics**
- **How is it Working?**
- **New & Noteworthy at NEMO**
- **The National NEMO Network**



Nonpoint Education for Municipal Officials



- **University of Connecticut**
- **Established 1991-1992**
- **CT staff = 3-4 people**
- **National staff = 2 people**
- **Supported mostly on grants**



Early NEMO workshops included innovative techniques to ensure participation.

9

Where NEMO Comes From

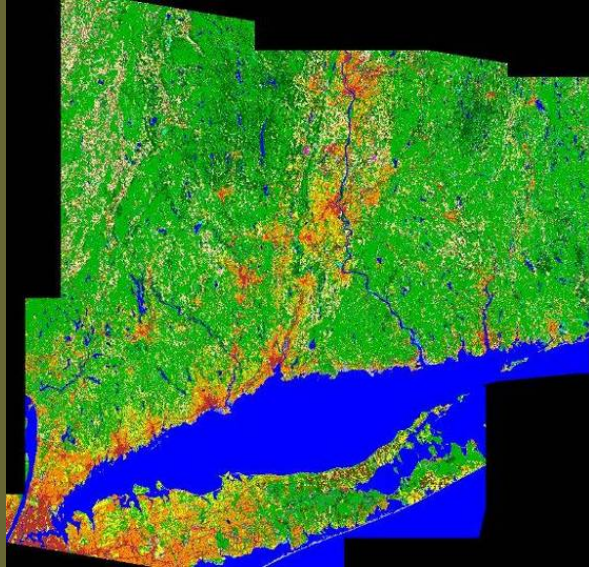
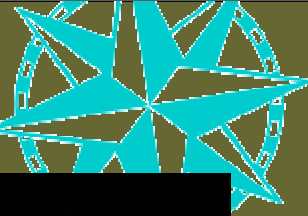
- **6% agriculture; 55% forest land**
- **49th of 50 states in % of federal land**
- **population density of 700/mi²**



Where NEMO Comes From

- **no county government since 1952**
- **half the towns have no professional staff**
- **no state Planning Office**
- **no state GIS Center or repository**
- **no legal connection between local plans & zoning regulations**

NEMO History: Long Island Sound

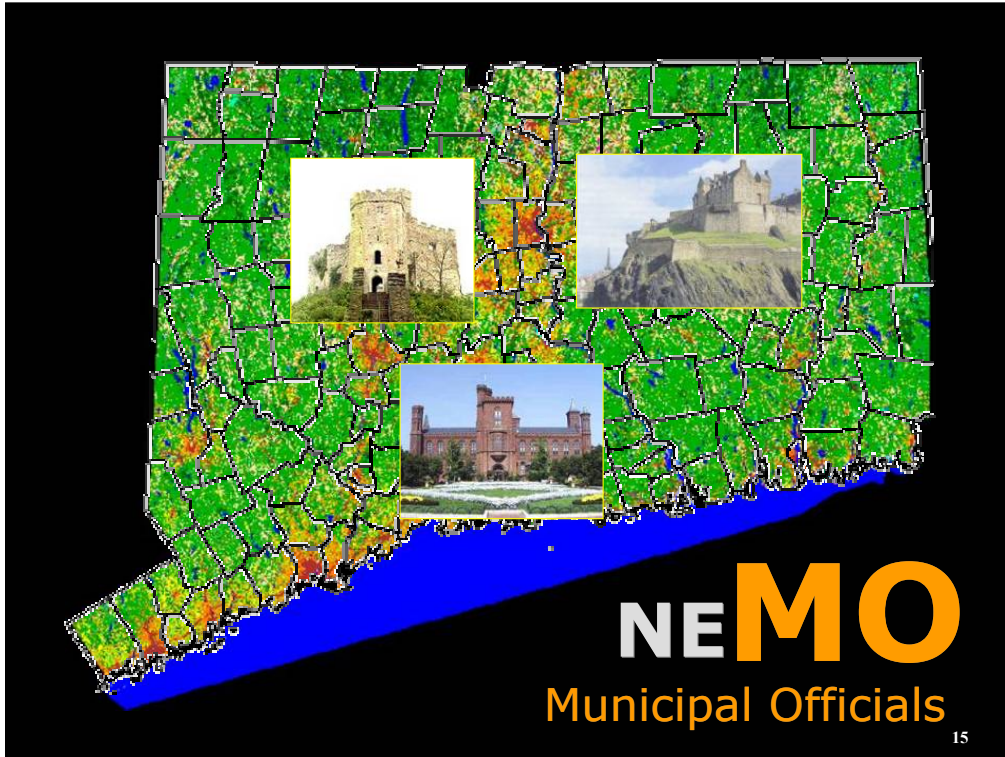


12



Underscore that urban NPS is a big issue coastal waters.





General patterns. Town boundaries as the key overlay vs. land use.



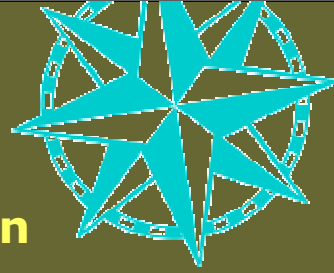
The Target Audience



Local land use decision makers

- Legal Mandates
- Full Plate
- High Turnover
- Complexity of Environmental Issues
- Inability to Track Cumulative Impacts

NEMO's Goal



Catalyze land use decision makers to:

- Ask the right questions
- Put development in greater context
- Get started on natural resource-based planning



17

Project goals.



The Message

**9 OUT OF 10
AMERICANS AGREE:**

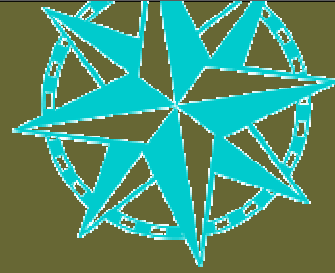


**NEMO
is
Nifty!**

- **Natural resource-based planning**
- **You can do this!**
- **Planning as self-determination**



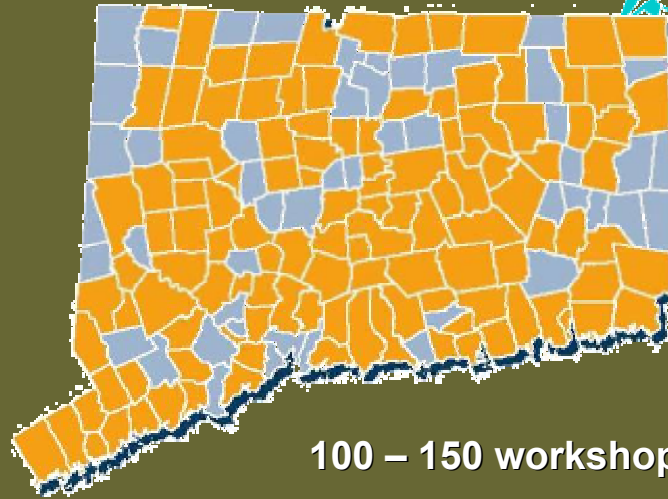
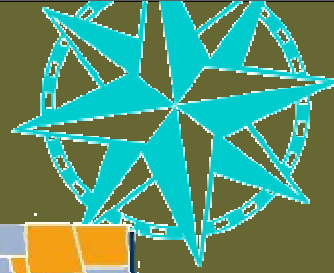
Modus operandi nemoidi



- We go to them
- We keep it brief
- We go only where invited!
- We try to bring all the boards together
- We make (judicious) use of geospatial technology

19

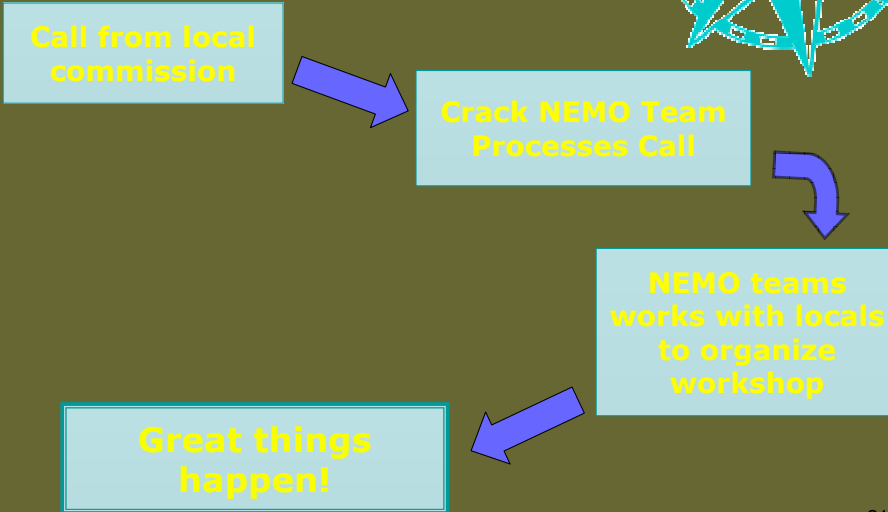
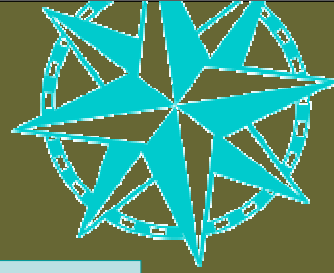
Where We've Worked



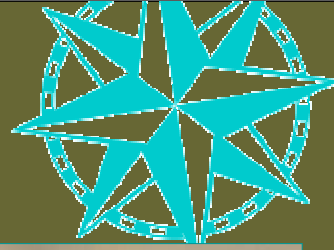
100 – 150 workshops/year

20

The Way It Works: *Option 1*



Bringing Different Boards Together

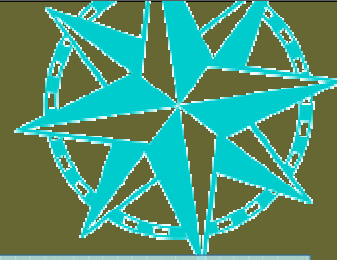


- Selectmen
- Planning
- Zoning
- Conservation
- Wetlands
- Economic Development
- Municipal departments
- Land Trust
- Watershed Groups
- Historical Society



22


The Way It Works: Option 2



The Municipal Initiative

Application Form
NEMO Project CT Municipal Program 2000-2001

1. Color in your municipality.



2. Name of municipality willing to work with the NEMO Team to incorporate water resource protection/conservation surface reduction through (Indicate by checking the boxes):

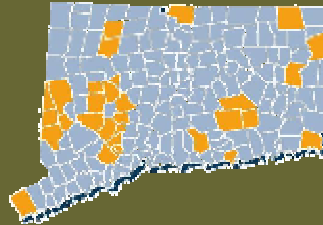
- Local resource inventory.
- Use of GIS system.
- Zoning regulations.
- Landowner regulations.
- Best standards.

3. The following people from your office are willing to contact with the NEMO Team. The indicated commission and departments are minimum requirements. Please indicate a contact person (name, title, etc.). Others may be included, as the municipality in cooperation with The NEMO Team, deems necessary.

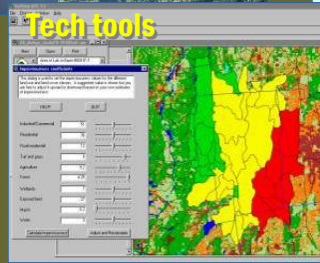
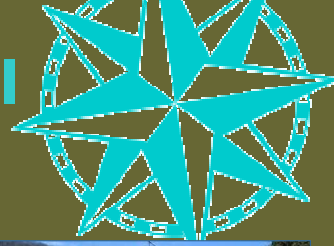
Name	Commission, Department	Email	Phone
	Planning		
	Local Resources		
	Comprehensive		
	Board of Selectmen		

The application and related materials are for NEMO Project. Copyright © 2000, New York State Office of General Services. All rights reserved.

- ✓ **Endorsement of town C.E.O.**
- ✓ **Creation of multi-commission "task force"**
- ✓ **Designation of principal contact person**
- ✓ **Agreement to pursue defined goals**



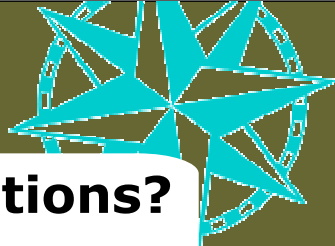
NEMO's Educational Arsenal



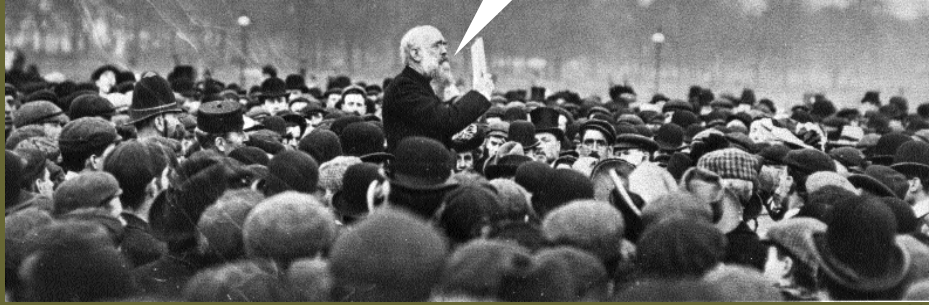


"Basic" NEMO:
Linking Land Use to Water Quality

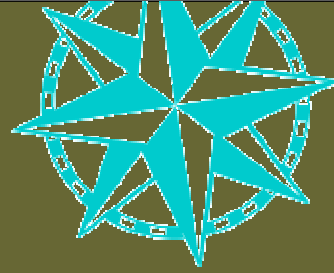
25



Questions?



Linking Land Use to Water Quality

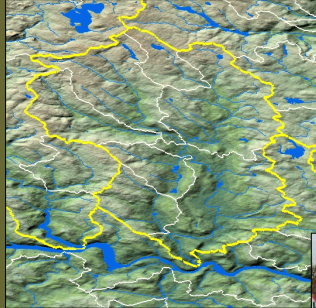
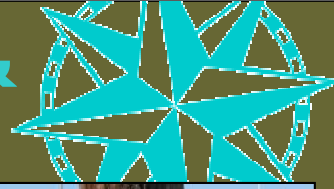


- 1. Water & Watersheds**
- 2. Land & Land Use**
- 3. Impervious Surface as an Indicator**
- 4. Natural Resource-Based Planning**

27

The four basic “chapters” of Basic NEMO. No room to get into any details here, but it has a heavy emphasis on land use and its potential impacts on water resources.

Part One: Water & Watersheds



Watersheds



**Water Quality
Impacts**



**Water Quantity
Impacts**

Part One: Water & Watersheds



urbanization & water quantity

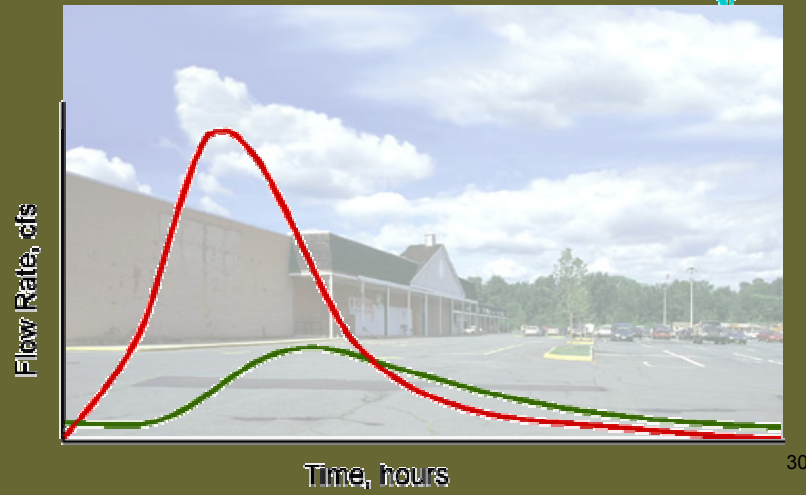


29

Part One: Water & Watersheds

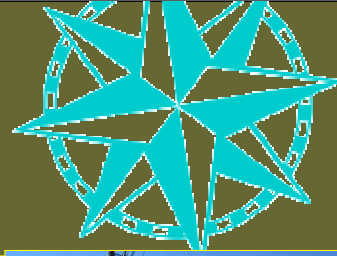


urbanization & water quantity



30

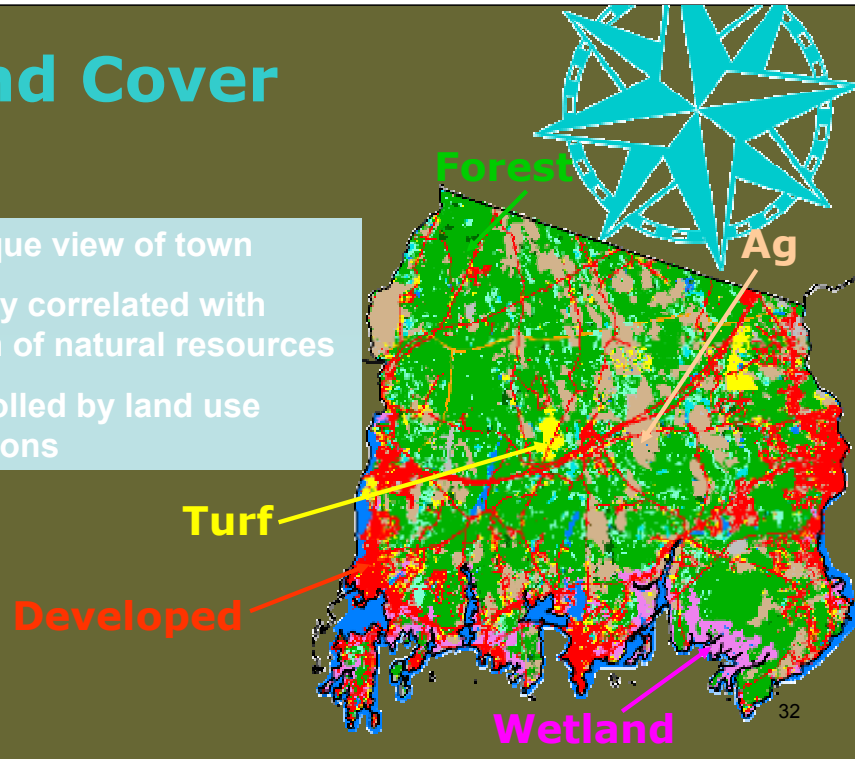
Part Two: Land & Land Cover



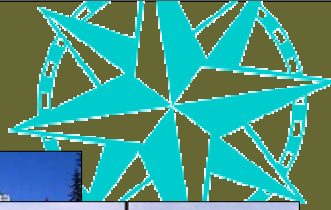
Underscore that urban NPS is a big issue coastal waters.

Land Cover

- a unique view of town
- closely correlated with health of natural resources
- controlled by land use decisions



A Road Runs Through It ...



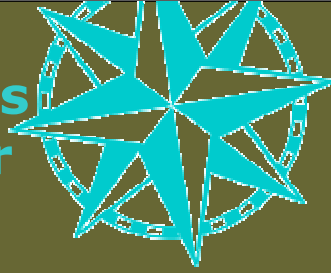
INTENSITY OF LAND USE

WATER QUANTITY/QUALITY PROBLEMS

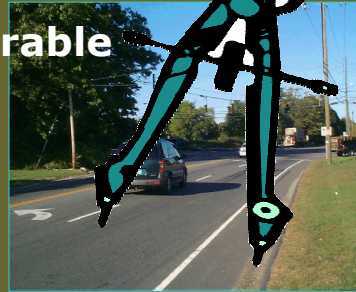
Amount of IMPERVIOUS SURFACES

33

Part Three: Impervious Surface as an Indicator



1. it simplifies complex impacts
2. it's tangible & measurable
3. It's generated by local land use regulations



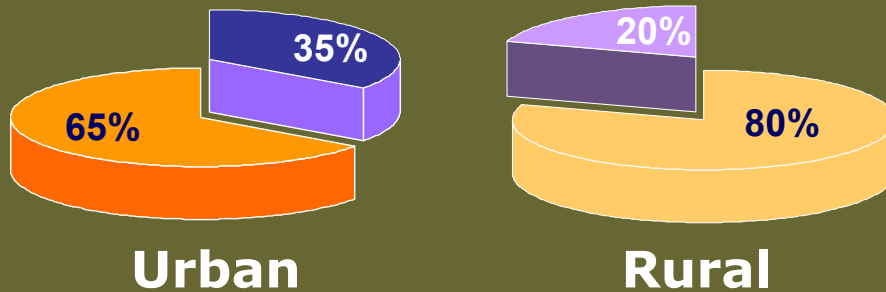
34

Regulations may even mandate IS creation.

The Impervious Surface Budget



Transportation (Parking Lots, Roads, Driveways, Sidewalks)
Structures (Offices, Stores, Houses, Patios)



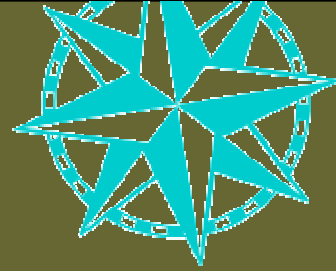
35

Derived from CLEAR Connecticut's Changing Landscape project data

Pie Chart: Impervious Surface budget (Structures and Transportation)

Look at how you can reduce impervious surface. Roughly 65% of our total impervious surface is for transportation (parking, driveways, roads), while 35% of the total is for structures (e.g. houses, stores, patios). It therefore often makes sense to focus on the transportation element, looking at where impervious surface can be reduced and where alternatives can be used.

**Part Four:
Natural Resource
Based Planning**



1. Planning

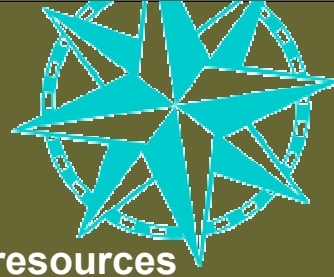
2. Site Design

3. (Mechanical) Best Management Practices

36

ns1158

Natural Resource Based Planning



inventory natural/cultural resources



- open space plan
- economic development plan

Plan of Cons. & Development

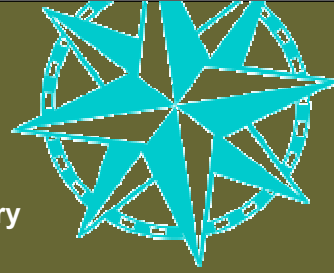


review/change land use regs & policies

37

You will be sick of this slide before the 2 days of Boot Camp are out! This is NEMO's recipe for resource-based planning.

Follow-up: Workshops

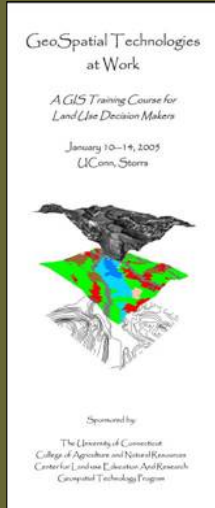


- **Conducting a Community Resource Inventory**
- **Open Space Planning**
- **Planning for Economic Development**
- **Revisiting Your Plan of Conservation & Development**
- **Farmland Protection**
- **Smart Growth**
- **Low Impact Development**
- **Natural Resource-Based Planning for Watersheds**
- **GIS in Your Town**
- **Map Reading 101**

38

But today and tomorrow, the focus is on the first two bullets: Open Space Planning, and Conducting a Community Resource Inventory. Go to it, Jim and John!

Follow-up: Tech Training

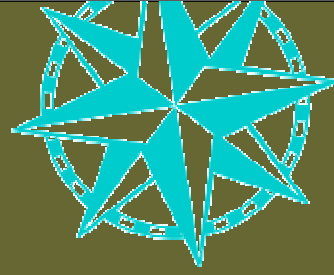


- geographic information systems (GIS)
- remote sensing (RS)
- global positioning systems (GPS)

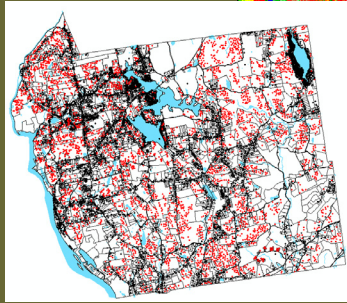
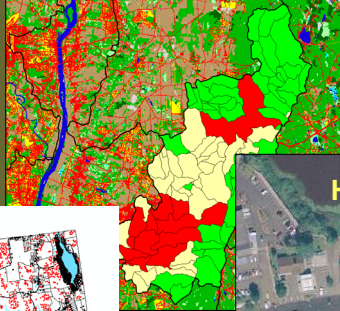


39

Follow-up: GIS Tools



"ISAT" Watershed Analysis

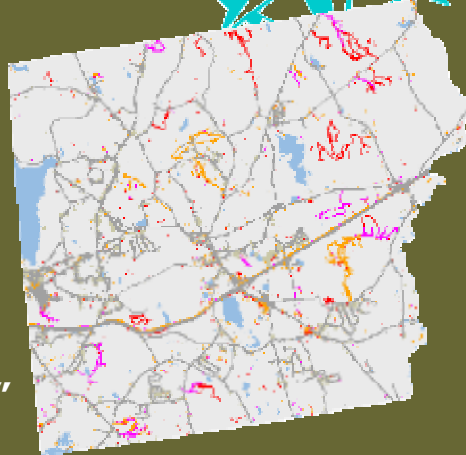


40

CommunityViz buildout analysis

Follow-up: Web Info & Tools

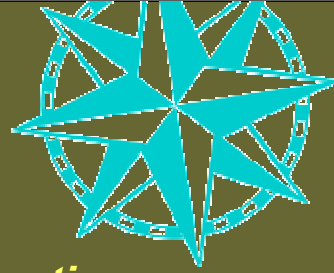
- PDF maps
- Data tables & charts
- Animations
- Interactive internet mapping site
- Downloadable data
- Client-driven "on the fly" data & maps, by town or watershed



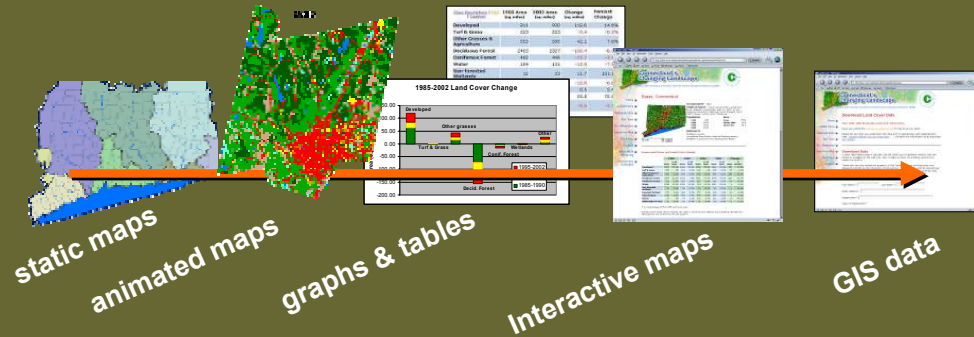
New development: 1985- 2002

41

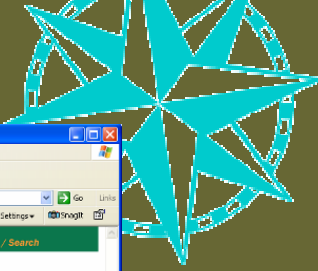
Follow-up: Web Info & Tools



A Range of web-based options



Lots More At:



clear CLEAR provides information, education and assistance to land use decision makers, in support of balancing growth and natural resource protection.

Research
Project Guide

Imagery & Data
Data Guide

Education
Program Guide

- NEMO Program
- National NEMO Network
- Land Use Academy
- Forestry
- Green Valley Institute
- Geospatial Technology Program
- Land Use Planning Program

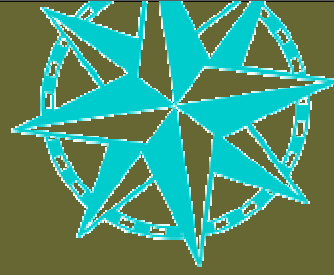
© University of Connecticut | [Disclaimers and Copyright Statements](#)

CLEAR is funded by the [University of Connecticut](#) and by a number of state and federal grants (please see [individual program webpages for details](#)). Major funding for CLEAR is provided by the [USGS Science Mission Directorate Applied Sciences Program](#).

University of Connecticut
College of Agriculture and Natural Resources

43

Questions?



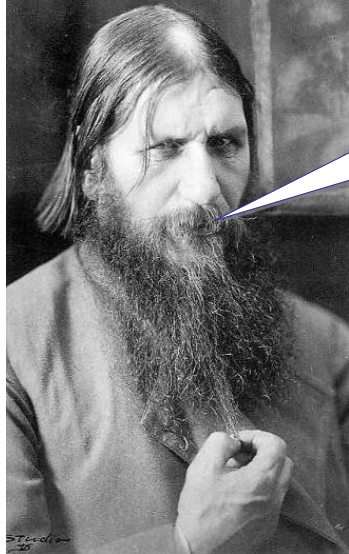
What We'll Cover



- **Brief & Painless Introduction**
- **NEMO Basics**
- **How is it Working?**
- **New & Noteworthy at NEMO**
- **The National NEMO Network**



Connecticut NEMO



Yes, yes.
But Does it Work?!


How NEMO Spells Success:




1. Research & information gathering
2. Changes to the decision making process
3. Changes to plans
4. Changes to regulations
5. On the ground changes
6. Beyond local impacts

Local Impacts: Examples

Putting Communities in Charge



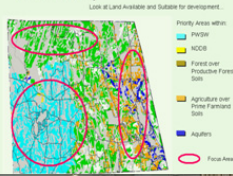
A progress report on an educational support system for local land use decision makers
Nonpoint Education for Municipal Officials



A program of the University of Connecticut Cooperative Extension and Sea Grant



In Summary





Woodstock, CT

- New natural resources inventory
- Resource inventory web site
- New open space plan
- Conservation Commission review of subdivision applications > 10 acres
- Conservation Commission of the Year award for 2004



Site/Subdivision Plan Review for Compatibility with Woodstock Plan of Open Space and Conservation

Revised by P.C. 10/01
 Prepared by P.C. 10/01
 PROJECT NAME/DESCRIPTION: _____ DATE CHECKLIST WAS COMPLETED: _____
 PROPOSED LOCATION: _____
 POINT OF CONTACT FOR PROJECT: (Name, Address, Phone Number) _____

NO.	RESOURCE:	Proposed Use Compatible/Adjacent to: (check all applicable items, and fill in the blanks):	CONSIDERATIONS:	RECOMMENDATIONS:
1.	Wetland & Water Resources (Please PG 14 and 15)	<input type="checkbox"/> Aquifer _____ ft. <input type="checkbox"/> Aquifer recharge _____ ft. <input type="checkbox"/> Wetland (100' buffer) _____ ft. or _____ ft. (100' or 200' ft.) <input type="checkbox"/> Flood plain public water supply? _____ ft. <input type="checkbox"/> Stream _____ ft. <input type="checkbox"/> Flood plain tributary stream? _____ ft. <input type="checkbox"/> Channel cross _____ ft. <input type="checkbox"/> Channel width _____ ft.	<ul style="list-style-type: none"> • Wetland (100' buffer) from development? • Protection against "leak" of least 10' from stream edge for wetland? 50' for riparian? 100' for flood plain? 100' for public water supply? • Protection of stream. 	<ul style="list-style-type: none"> • No Development • No Development
2.	Open Space, Surface:	<input type="checkbox"/> Preserve surface _____ ft. or _____ ft. <input type="checkbox"/> % Slope steeper +10% adjacent to water _____ ft.	<ul style="list-style-type: none"> • Protect surface "preserve" (100' or 200' ft. from development) - 100' or 200' ft. from water. • Slope (10% or steeper) adjacent to water. • Slope (10% or steeper) adjacent to water. 	<ul style="list-style-type: none"> • No Development • No Development
3.	Open Space, Wetland/Stream (Other PG)	<input type="checkbox"/> Forest cover/development forest _____ ft. <input type="checkbox"/> Open space _____ ft. <input type="checkbox"/> Open space _____ ft.	<ul style="list-style-type: none"> • Forest cover/development forest (100' or 200' ft. from development) - 100' or 200' ft. from water. • Open space (100' or 200' ft. from development) - 100' or 200' ft. from water. • Open space (100' or 200' ft. from development) - 100' or 200' ft. from water. 	<ul style="list-style-type: none"> • No Development • No Development
4.	Wetland/Stream (Other PG)	<input type="checkbox"/> Wetland/Stream adjacent _____ ft. <input type="checkbox"/> Wetland/Stream adjacent _____ ft.	<ul style="list-style-type: none"> • Wetland/Stream adjacent (100' or 200' ft. from development) - 100' or 200' ft. from water. • Wetland/Stream adjacent (100' or 200' ft. from development) - 100' or 200' ft. from water. • Wetland/Stream adjacent (100' or 200' ft. from development) - 100' or 200' ft. from water. 	<ul style="list-style-type: none"> • No Development • No Development

49

Review check list



Old Saybrook, CT

- New town road policy
- Zoning changes to limit impervious surfaces
- New natural resource inventory
- New open space plan
- Changes to comprehensive plan
- New “residence conservation” district
- Model “low impact” subdivision





Waterford, CT

- Wetland/pond stormwater complexes required for major commercial development
- Zoning changes to lower minimum parking ratios
- water quality review of all proposed development
- National “low impact” design monitoring/demonstration project
- Regular monitoring of stormwater BMPs and major waterways



A Tale of 3 Towns



- New natural resources inventory
- Resource inventory web site
- New open space plan
- Conservation Commission review of subdivision applications > 10 acres
- Conservation Commission of the Year award for 2004



- New town road policy
- Zoning changes to limit impervious surfaces
- New natural resource inventory
- New open space plan
- Annual natural resource tour
- Changes to comprehensive plan
- New "residence conservation" district
- Model "low impact" subdivision



- Wetland/pond stormwater complexes required for major commercial development
- Zoning changes to lower minimum parking ratios
- Pre development infiltration levels required for new commercial development
- National "low impact" monitoring/demonstration project
- Regular monitoring of stormwater BMPs and major waterways



A Lot of Good Natural Resource-Based Planning Going On



Gaining Momentum On LID

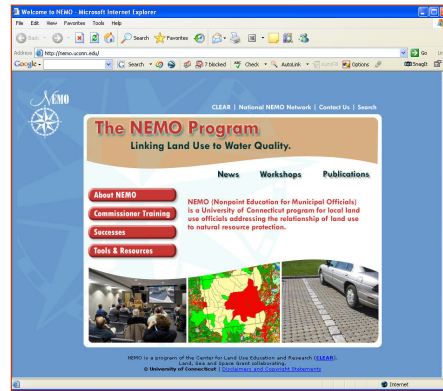


What We'll Cover

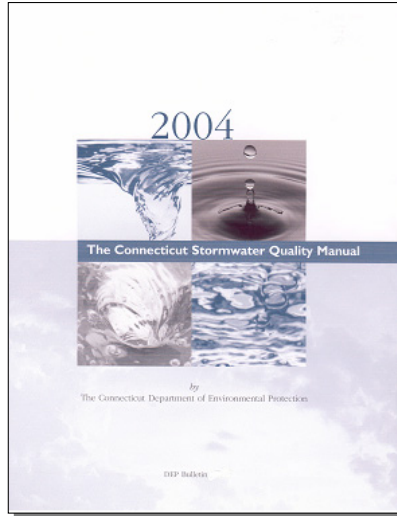
- Brief & Painless Introduction
- NEMO Basics
- How is it Working?
- **New & Noteworthy at NEMO**
- The National NEMO Network

New & Noteworthy: Stormwater / LID

1. CT Stormwater Quality Manual
2. Contractor LID workshops
3. Online LID database
4. Rain Garden manual
5. Jordan Cove DVD



The 2004 Stormwater Quality Manual Blitzkrieg



- >1000 people trained
- every last manual handed out
- training sessions for state agencies
- Partnered with regional planning and professional organizations



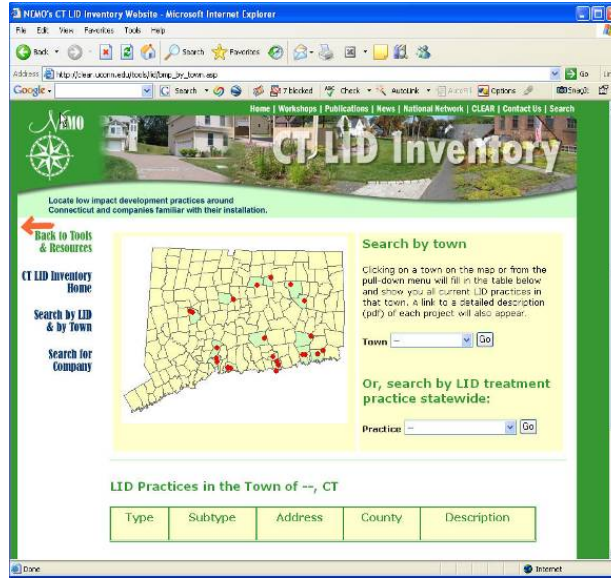
Contractor's Workshops



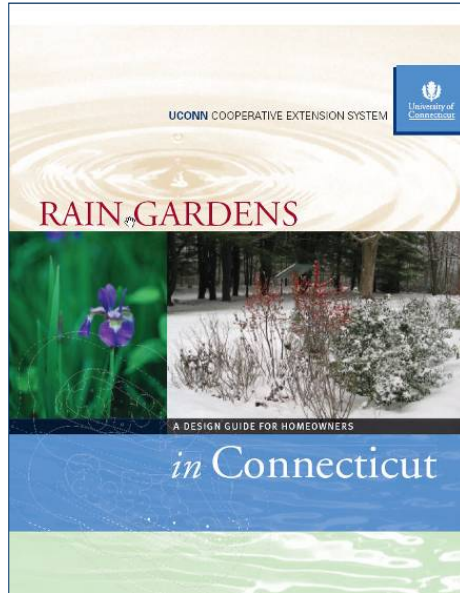
Next Workshop: Winter 2007

LID Inventory Site

Search by
Town or by
Practice



Rain Garden Manual



Designing your rain garden

Calculating the size of your rain garden

Based on the amount of roof runoff from your home. The house has a footprint of **60 feet x 30 feet, or 1800 sq. ft.** One quarter of the roof area contributes to the gutter near where the rain garden is to be built. So the contributing area would be **1800 sq. ft. x .25 = 450 sq. ft.** This area is then divided by 4, so that the square footage of the rain garden would be **450 sq. ft. ÷ 4 = 112.5 sq. ft.** A nicely shaped rain garden might be **16 ft x 7.5 ft.** However, you have the flexibility to make it any shape you want, as long as you approximate the size.

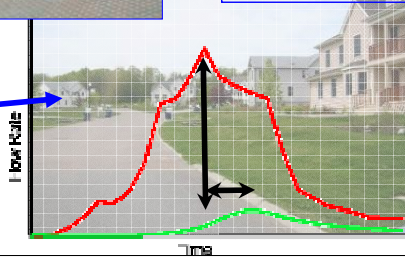
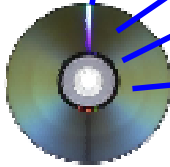
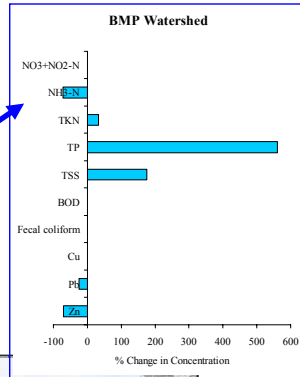
EXAMPLE:

Diagram photo adapted from the University of Vermont Extension, Rain Garden: A Guide to Manual for Homeowners.

in Connecticut: A Design Guide for Homeowners

60

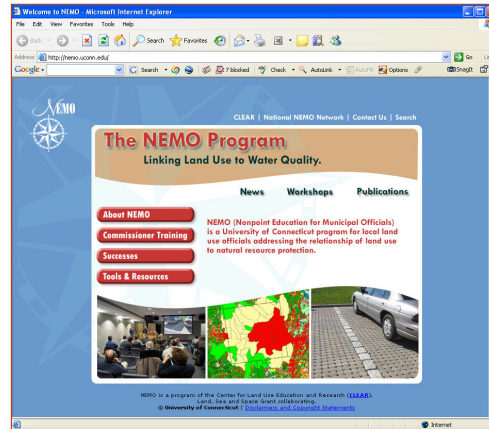
Jordan Cove DVD



61

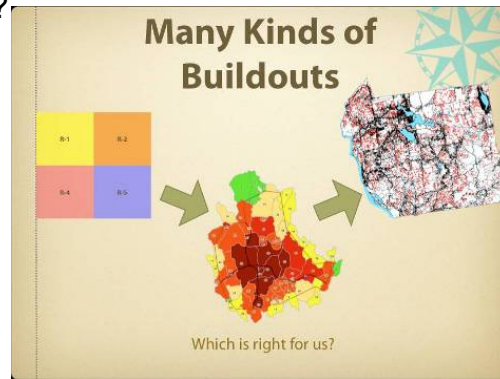
New & Noteworthy: Planning

- Buildout Publication
- Land Use Academy
- Online Community Resource Inventory



Buildout Publication

- What exactly is a “buildout”?
- Where does it fit into community planning?
- What can it be used for?
- What are the different types of buildout?
- Methods
- Examples



CT Land Use Academy

- **OPM Program, funded by CT Legislature based on several statewide reports**
- **3 “courses” per year, 3 workshops per course:**
 - ❖ Roles & Responsibilities (CLEAR)
 - ❖ What’s Legally Required (CT Bar Assoc.)
 - ❖ Map Reading for Site Plan Review (CLEAR)



Online Community Resource Inventory

Community Resource Inventory - CT NEMO Program - Microsoft Internet Explorer

Community Resource Inventory Online
A Response Resource for Connecticut Communities

Welcome

Why a Resource Inventory?

This website supports the NEMO workshop *Conducting a Community Resource Inventory*. This site will enable you to develop a Community Resource Inventory for your town using available strategies information. A Community Resource Inventory (CRI) is a list or atlas of the natural and cultural resources in your community. The maps contained are appropriate for community-level planning and not for site-level assessment.

After choosing your municipality at [Build Your CRI](#), you can page through a series of town maps showing important natural and cultural resources, and access this information in both document (PDF) and data (GIS) formats (**Coming Summer 2006**). While the inventory should be considered a "bare bones" version that can be enhanced and improved by other sources of data, it nonetheless provides a foundation for sound, future planning decisions.

Conducting a CRI is the first step in community planning. In order to effectively plan for your community's future, you need to have a handle on the natural, cultural and economic resources your town possesses. It is quite literally the first step in the planning process.

What is the Planning Process?

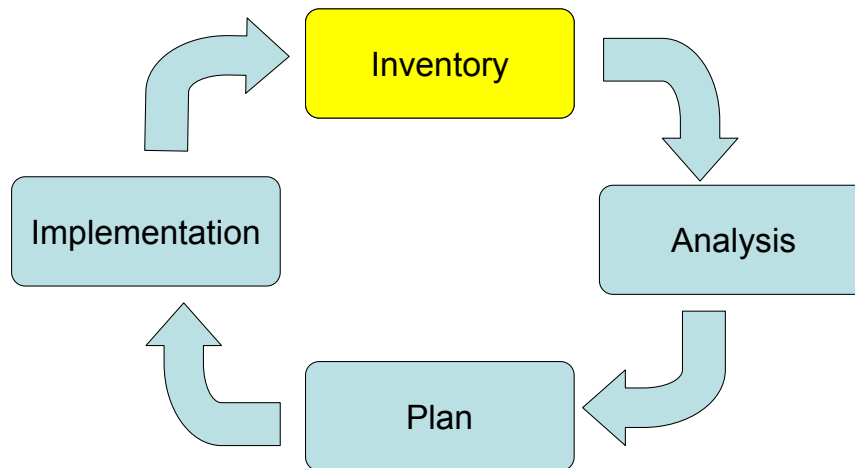
The Planning Process

```
graph TD; Inventory --> Analysis; Analysis --> Plan; Plan --> Implementation; Implementation --> Inventory;
```

An idealized process for planning generally takes place in 4 steps. We have already acknowledged that the **Inventory** is the first step in the process. But there is often times confusion between compiling a database of information and maps for your town, and the analysis of that information. **Analysis** is a separate activity from the inventory and usually



The Planning Process



66

How do we get started with a Community Plan?

An idealized process for planning generally takes place in 4 steps. We have already acknowledged that the **Inventory** is the first step in the process. But there is often times confusion between compiling a database of information and maps for your town, and the analysis of that information. **Analysis** is a separate activity from the inventory and usually involves the manipulation of the data in order to answer questions you or your group have about your town. The analysis step leads directly to the formulation of the **Plan**, which sets priorities and goals for your town. The Plan also lays out a process for the attainment of the community's goals, which are carried out during the **Implementation** phase - that is, getting real things accomplished.

Community Resource Inventory - CT NEMO Program

http://137.99.85.71/clearweb/projects/cri/cri_online/00b_location.asp?listtown=7

Think Secret MacInTouch Home Page Apple Yahoo! NEMO Your Town CRI Online NWS News Google

NEMO CRI Community Resource Inventory Online
A mapping resource for Connecticut communities.

CRI Home Build Your CRI Use Your CRI Expand Your CRI

Location map
You've Chosen: **Lebanon, CT**

Map Sets

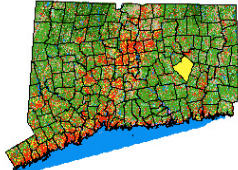
Natural Resources

1. Base Map
2. Topo
3. Land Cover
4. Soils
 - Wetland Soils
 - Farmland Soils
5. Water Resources
 - Watersheds
 - Surface Water
 - Ground Water
6. Unique & Fragile
7. Open Space

Cultural Resources

1. Transportation
2. Utilities
3. Regulated Lands

Print Your CRI



Incorporated - 1700
Origin of Name - Named 1697 from Lebanon in Syria; Hebrew name = white; incorporated Oct., 1700.

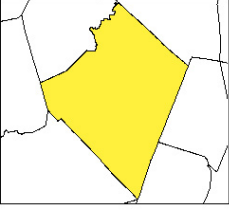
Population

1850	1901	Area	
1900	1521	Acres	35308
1950	1654	Square Miles	55.2
2000	6907	Square Km	142.9

Belongs to
New London County
Windham Region Council of Governments
Northeast Economic Development Region

Oops, wrong town! Select Another
Lebanon Go

Proceed to the **Lebanon CRI**
Next →



Special thanks to the Environmental and Geographic Information Center (EGIC) of the Connecticut Department of Environmental Protection.

67

Go to "http://137.99.85.71/clearweb/projects/cri/cri_online/10_reg.asp?listtown=71"

Community Resource Inventory - CT NEMO Program
 http://137.99.85.71/clearweb/projects/cri/cri_online/02_topo.asp?listtown=71

Think Secret MacInTouch Home Page Apple Yahoo! NEMO Your Town CRI Online NWS News Google

NEMO **CRI** Community Resource Inventory Online
 A mapping resource for Connecticut communities.

CRI Home Build Your CRI Use Your CRI Expand Your CRI

2. Lebanon Topography

Map Sets

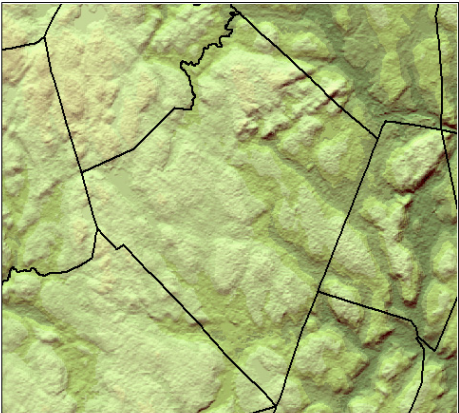
Natural Resources

1. Base Map
2. Topo
3. Land Cover
4. Soils
 - Wetland Soils
 - Farmland Soils
5. Water Resources
 - Watersheds
 - Surface Water
 - Ground Water
6. Unique & Fragile
7. Open Space

Cultural Resources

1. Transportation
2. Utilities
3. Regulated Lands

Print Your CRI



[← Back](#) [Next →](#)

Lebanon

To Orient Yourself:

- [Turn Roads On](#)

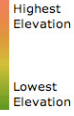
More Information:

- [Topography](#)

Other Common Topography Sources:

- USGS Topo Maps

Legend:



Download and print pdf of the topography for Lebanon.

Topography allows you to assess the "lay of the land" and understand where the steep and gradual slopes are within a town. These maps are derived from a "digital elevation model"

68

Community Resource Inventory - CT NEMO Program

http://137.99.85.71/clearweb/projects/cri/cri_online/03_landcover.asp?listtown=

Think Secret MacInTouch Home Page Apple Yahoo! NEMO Your Town CRI Online NWS News Google

NEMO **CRI** Community Resource Inventory Online
A mapping resource for Connecticut communities.

CRI Home Build Your CRI Use Your CRI Expand Your CRI

3. Lebanon Land Cover

Map Sets

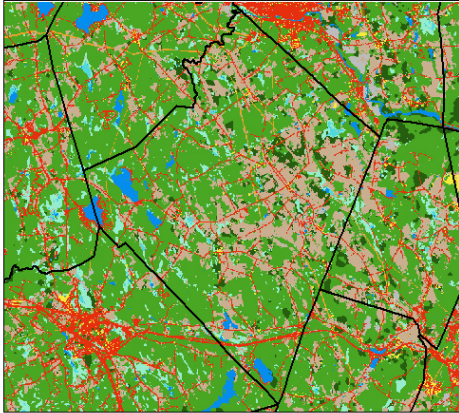
Natural Resources

1. Base Map
2. Topo
3. Land Cover
4. Soils
 - Wetland Soils
 - Farmland Soils
5. Water Resources
 - Watersheds
 - Surface Water
 - Ground Water
6. Unique & Fragile
7. Open Space

Cultural Resources

1. Transportation
2. Utilities
3. Regulated Lands

Print Your CRI



More Information:

- 2002 Land Cover

Other Common Sources of Land Cover:

- National Land Cover Dataset (NLCD)

Legend:

- Urban
- Turf and Grass
- Agriculture
- Deciduous Forest
- Coniferous Forest
- Water
- Non-forest Wetland
- Forested Wetland
- Coastal Wetland
- Barren
- Utility Right-of-Way

Download and print pdf of the land cover map for Lebanon.

Lebanon

Back Next

Land cover data comes from the UConn Center for Land use Education And Research (CLEAR). It is based on information from the Landsat satellite, and relates what is on the surface of the land to various natural resources and developed areas. The land cover data is

69

Community Resource Inventory - CT NEMO Program

http://137.99.85.71/clearweb/projects/cri/cri_online/04c_soilfarm.asp?listtown=70

Think Secret MacInTouch Home Page Apple Yahoo! NEMO Your Town CRI Online NWS News Google

NEMO **CRI** **Community Resource Inventory Online**
 A mapping resource for Connecticut communities.

CRI Home **Build Your CRI** **Use Your CRI** **Expand Your CRI**

Map Sets

Natural Resources

1. Base Map
2. Topo
3. Land Cover
4. Soils
 - Wetland Soils
 - Farmland Soils
5. Water Resources
 - Watersheds
 - Surface Water
 - Ground Water
6. Unique & Fragile
7. Open Space

Cultural Resources

1. Transportation
2. Utilities
3. Regulated Lands

Print Your CRI

4. Lebanon Farmland Soils

To Orient Yourself:

- Turn Roads On

More Information:

- Farmland Soils (To DEP)

Legend:

- Municipal Boundary
- Additional CT Important Farmland Soils
- Prime Farmland Soils

Download and print pdf of the soils map for Lebanon.

Lebanon Go

← Back Next →

The soils data is made up of many small map units, which may be dominated by a single soil, a mixture of soils, or non-soil areas. Soils data was collected by the USDA NRCS (formally the Soil Conservation Service) between 1962-1995. This maps shows all the soils units (thin grey lines), but highlights soils

70

Community Resource Inventory - CT NEMO Program
 http://137.99.85.71/clearweb/projects/cri/cri_online/05b_swater.asp?listtown=71

Think Secret MacInTouch Home Page Apple Yahoo! NEMO Your Town CRI Online NWS News Google

NEMO **CRI** **Community Resource Inventory Online**
 A mapping resource for Connecticut communities.

CRI Home **Build Your CRI** **Use Your CRI** **Expand Your CRI**

Map Sets

Natural Resources

1. Base Map
2. Topo
3. Land Cover
4. Soils
 - Wetland Soils
 - Farmland Soils
5. Water Resources
 - Watersheds
 - Surface Water
 - Ground Water
6. Unique & Fragile
7. Open Space

Cultural Resources

1. Transportation
2. Utilities
3. Regulated Lands

Print Your CRI

5. Lebanon Water Resources: Surface Water

To Orient Yourself:

- Turn Roads On

More Information:

- Hydrography (To DEP)

Legend:

- Municipal Boundary
- Water
- Shore
- Intermittent Water
- Flats
- Water
- Intermittent Water
- Flats
- Rocks
- Inundated Area
- Marsh on Quad

Download and print pdf of the surface water for Lebanon.

Lebanon Go

← Back Next →

The surface water map shows the key streams, rivers, ponds, lakes and coastal resources in your town. Waterways are the "lifelines" of the aquatic ecosystem, and can be critical components of your drinking water system. They also may serve as a recreational resource. As

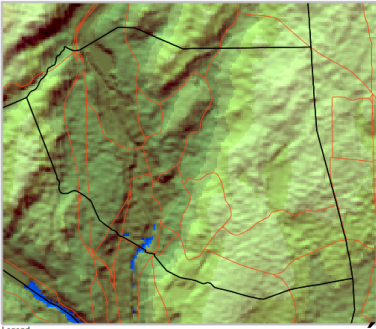
71

Community Resource Inventory - CT NEMO Program

http://137.99.85.71/clearweb/projects/cri/cri_online/finish.asp?listtown=71

Topography Ansonia

Community Resource Inventory Map Series



Legend

- Towns
- Primary Roads
- Secondary Roads
- Highest Elevation
- Lowest Elevation

Topography allows you to assess the "lay of the land" and understand where the steep and gradual slopes are within a town. These maps are derived from a digital elevation model developed by the U.S. Geological Service that determines the elevation of an area by assigning elevations to a regularly spaced grid. The resolution or size of the grid cells is about 30-meters (approximately 100-feet).

Visit <http://clear.uconn.edu/projects/cri/> for more information.

Data source: USGS National Elevation Dataset painted relief.

This project was funded in part by the CT DEP through an EPA Clean Water Act Section 319 Nonpoint Source Grant. NEMO is an educational program of the Center for Land Use Education and Research (CLEAR) at the University of Connecticut. These maps are intended for general information and planning.

5. Water Resources:

- Basins
- Basins with Roads
- Surface Water
- Surface Water with Roads

Resources Inventory

	Pdf	
	Pdf	link
	Pdf	link
	Pdf	link
	Pdf	link
	Pdf	link
	Pdf	link
	Pdf	link
	Pdf	link
	Pdf	link
	Pdf	link
	Pdf	link

Print Your CRI

72

Community Resource Inventory - CT NEMO Program
 http://137.99.85.71/clearweb/projects/cr/expand_cri.htm

Mac Rumors Your Town NEMO MacInTouch Home Page Apple Amazon News Yahoo! NWS Google CRI Online

NEMO **CRI** Community Resource Inventory Online
 A mapping resource for Connecticut communities.

CRI Home Build Your CRI Use Your CRI Expand Your CRI

Expand Your CRI

Data in GIS format and how to use it

Coming Soon! GIS Data packaged for each municipality, how to use it and how to add other data layers.

- [More Resources](#)

Other helpful data layers not currently available on a statewide basis

Under Construction!

Transportation

- **Community facilities** such as schools, government buildings, and community centers
- **Utility lines** which can be obtained from the utility companies, or from aerial photographs
- **Parcels** which can be obtained from the town tax assessor

Regulated Lands

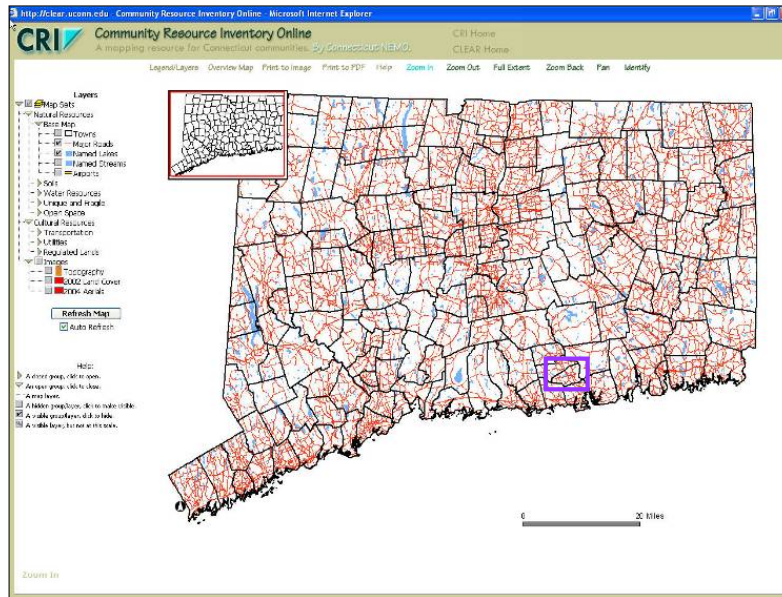
- **Local zoning** is the most prevalent type of regulation in your town, designating what use and density of development is allowed; local zoning is not available statewide, but would be an important inventory layer to acquire for your CRI.

CRI Home
 Schedule a CRI Presentation
 Contact Us
 CLEAR Site
 CT NEMO Site
 Search Site

73

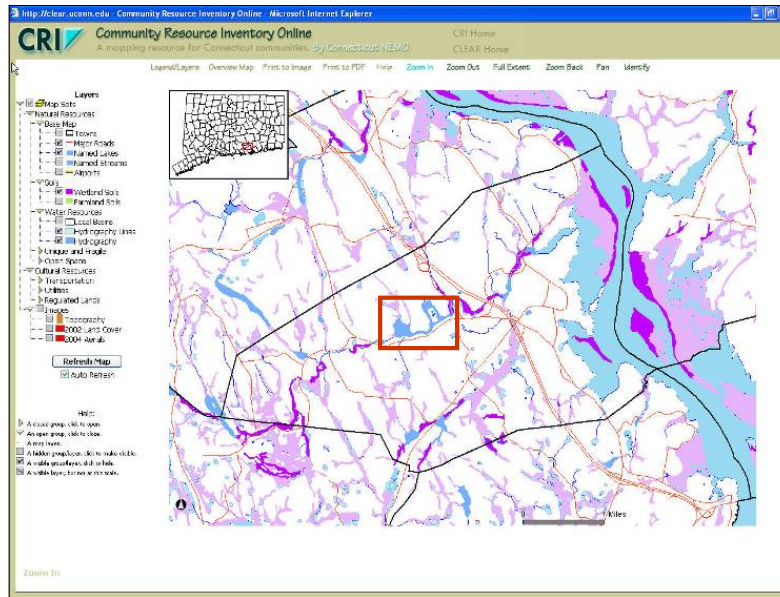
There were 2 errors opening the page. For more information, choose Activity from the Window menu.

Interactive Mapping on the Web



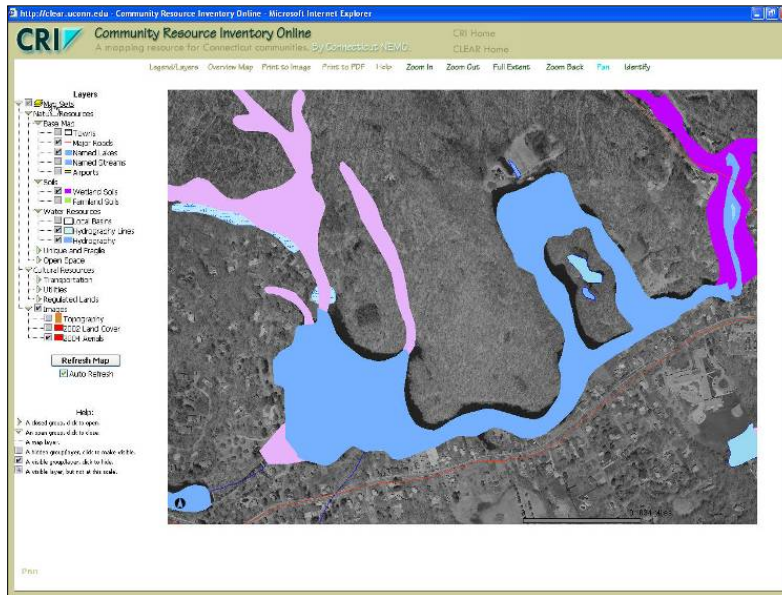
74

Interactive Mapping on the Web

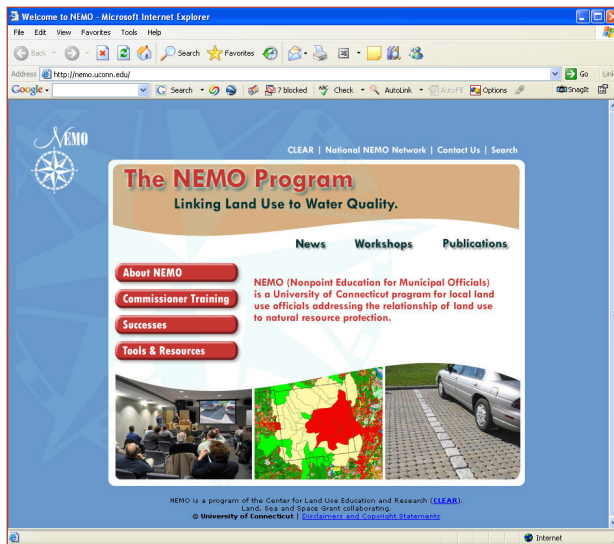


75

Interactive Mapping on the Web



Questions?



<http://nemo.uconn.edu>

What We'll Cover

- Brief & Painless Introduction
- NEMO Basics
- How is it Working?
- New & Noteworthy at NEMO
- **The National NEMO Network**



The National NEMO Network



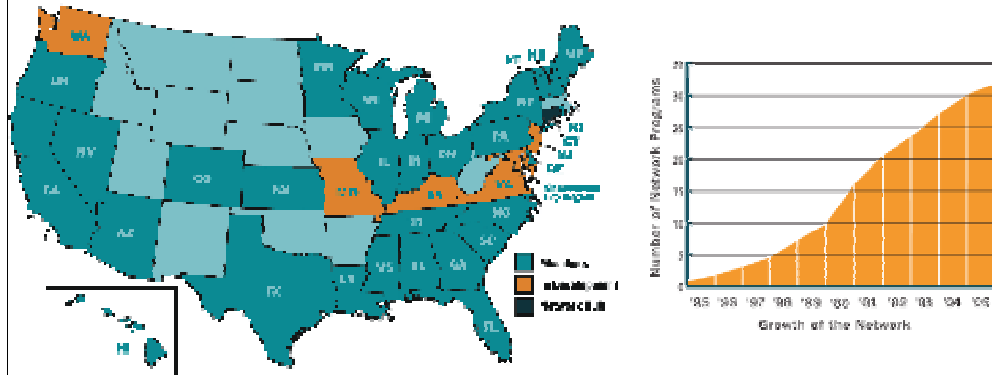
- **A Land Use Education Network**
- **The Network Hub**
- **The Results**

NEMO Road Show...



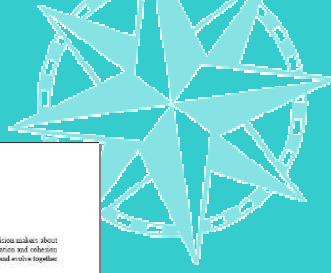
80

The National NEMO Network



A group of **educational** projects focused on the relationship of **land use** to natural resource protection, **sharing** information, materials and educational models.

Who is a Member?



Who we are
What we do

How we'll interact
Communication
Acknowledgement
Reporting Impacts

National NEMO Network
Charter of Operation

The National NEMO Network is a group of affiliated projects that educate local land use decision makers about the relationship of land use to natural resource protection. In order to maintain the communication and education necessary to exist as a viable Network, and to ensure the level of collaboration required to grow and evolve together as a Network, we hereby agree to the following statement:

As a National Network member, we endorse these common elements:

- 1 Our project is a non-exploitative, educational program. Our educational materials and methods are intended for educational, non-commercial use only.
- 2 Our project was adapted and is created with the knowledge and assistance of the University of Connecticut NEMO Project.
- 3 Our project endorses the Network mission statement of helping communities better protect natural resources while accommodating growth. To this end, our project addresses land use issues and promotes natural resource-based land use planning and other related techniques.
- 4 Our project has a primary target audience of local land use decision makers, as defined by project partners for our site.

As a National Network member, we agree to:

- 1 Recognize the central coordinating role of the University of Connecticut NEMO "Network Hub," and the importance of the necessary communication with the Hub upon which this coordination depends. The Hub acts to create communication with Network members and facilitates communication among Network projects. Hub services include Web-based communication, Network conferences, work shops, phone consultations, and liaison activities with the National NEMO Network Interagency Work Group.
- 2 Recognize and promote our relationship with the National NEMO Network. While our project remains principally identified with our primary organization, we agree to recognize our relationship with the Network on our educational materials and products as per guidelines established by the Hub. We also agree to represent the Network at meetings or conferences, when deemed appropriate by coordination between us and the Hub.
- 3 Share information and materials freely with other Network projects, so that the Network becomes "more than the sum of its parts" through the multiplying effects of information sharing. Materials adapted directly from other Network projects must acknowledge the original project as deemed appropriate by that project.
- 4 Provide information and materials to the Network Hub, for the purpose of information sharing and Network-wide reporting and marketing. The Hub will reflect and organize these materials into Network publications and reports for the use and benefit of the entire Network.

By signing below, we agree to the above statements.

Name	Project	Date
------	---------	------

By signing below, we agree that this project is a Charter member of the National NEMO Network.

David DeBruin <small>Director, NEMO Coordinator</small>	Date
--	------

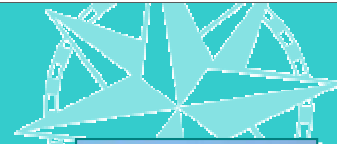
NEMO Family Values



- **The IMPACT OF LAND USE on water resources is the issue**
- **LOCAL LAND USE DECISION MAKERS are the target audience**
- **EDUCATION is the method**
- **NATURAL RESOURCE-BASED PLANNING is the solution offered**
- **GEOSPATIAL TECHNOLOGY is used to enhance the education**

83

Adapting NEMO



Natural Resource-Based Planning R Us

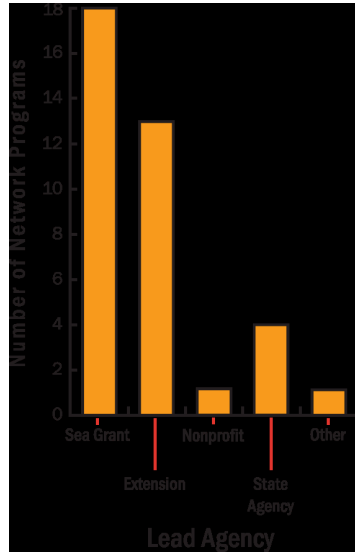
1. Planning

2. Site Design

3. (Mechanical) Best Management Practices



NEMO Project Leadership

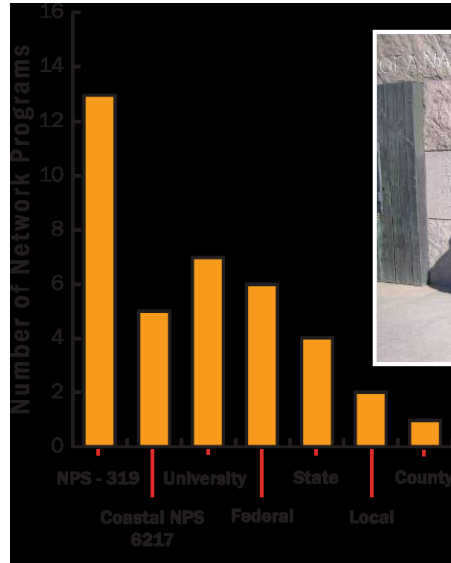


Most NEMO projects are led by University-based Extension and/or Sea Grant Extension staff.



86

NEMO Project Funding



PA, IN, & MN NEMO Directors seeking funds in Washington DC

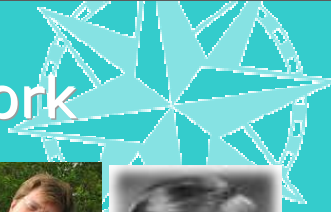
Dispelling NEMO Myths



- **The Network is not the creation of any one agency or organization.**
- **NEMO is not an invasive species.**
- **Our coordination of the Network is through the force of our sparkling personality (i.e., we give them no \$\$!).**



Coordinating the Network



Coordinator Dickson



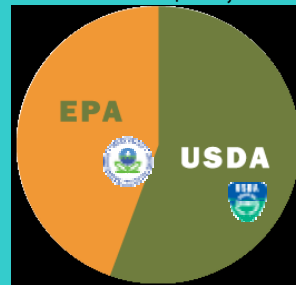
Founders:



Communicator (& Head Backhoe Driver) Bonsack

2005-2006: \$153,000

Funders:





Network Hub Services

Getting Started

- Scoping Workshops
- Publications
- Starter Kit

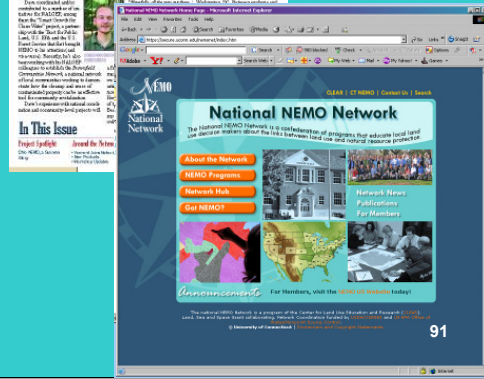




Network Hub Services

Connecting Programs

- Listserv
- Website
- Sharing Libraries
- Newsletter





Network Hub Services

NEMO University



National NEMO Network
NEMO University
 October 17 - 19, 2006
 Haddam, CT

Uncle NEMO Wants U!



National NEMO Network
 PRESENTS
NEMO U3
 SEP 13-19-21, 2006
 EPOCH MARINE CENTER
 AVELY POINT, CT



National NEMO Network
 PRESENTS
CINCO DE NEMO
NEMO U3 MIDDLETOWN COMEDYCLUB
 OCTOBER 16 - 19, 2006



Come Dance with US!
NEMO U2
 DANCING 20-30, 2006
 IN THE
CULTURE CENTER

It will be grand!



National NEMO Network
 PRESENTS
NEMO U3ia
 AUGUST 24 - 26, 2006



Network Hub Services

Enhancing Programs

- Open Space Planning
- ISAT Training
- Enhancing Coastal NEMO Programs
- Basic GIS Training

National NEMO Network
OPEN SPACE PLANNING BOOT CAMP
 UConn Marine Campus
 Avery Point, CT
 August 5 & 6, 2002

Enhancing Coastal NEMO Programs

Using the NEMO Network, Project Profile #2

The Project
 In 2002, the Director of NOAA signed their agreement to fund the Coastal NEMO Program through the National Oceanic and Atmospheric Administration. The Coastal NEMO Program, National Sea Grant College Program, National Oceanic and Atmospheric Administration and Coastal Ocean Center established the Network.

Goal
 The goal of the program is to enhance the effectiveness of coastal NEMO programs to enhance their educational efforts. The program was awarded a total of \$1,000,000 in 2002.

Objectives
 The program was awarded a total of \$1,000,000 in 2002. The program was awarded a total of \$1,000,000 in 2002.

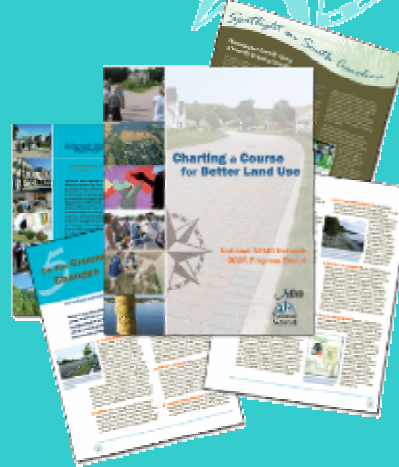
Results
 The program was awarded a total of \$1,000,000 in 2002. The program was awarded a total of \$1,000,000 in 2002.

Conclusion
 The program was awarded a total of \$1,000,000 in 2002. The program was awarded a total of \$1,000,000 in 2002.



Network Impacts

1. **Research & information gathering**
2. **Changes to the decision making process**
3. **Changes to plans**
4. **Changes to regulations**
5. **On the ground changes**
6. **Beyond local impacts**





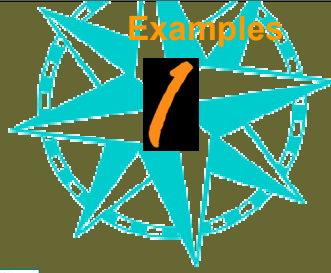
Research & Information Gathering



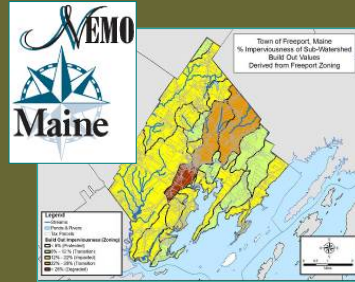
- **Natural resource inventories**
- **Watershed characterizations**
- **Buildout analyses**
- **Landscape visualizations**
- **Runoff and other modeling**

Research . . .

Examples



NRBP Guide



Impervious Surface Analysis



Changes to the Decision Making Process



- **Inter-commission committees**
- **Special committees**
- **Study groups**
- **Multi-town work groups**
- **Watershed efforts**
- **“Asking the right questions”**

97

Process Changes . . .

Examples

2



Inter-Governmental Partnerships



Asking the Right Questions

3

Changes to Plans



- **Comprehensive plans**
- **Open space plans**
- **Economic development plans**
- **Watershed plans**
- **Special area plans**

Changes to Plans...

Examples

3



Comprehensive Plans



Open Space/Conservation Plans

4

Changes to Regulations



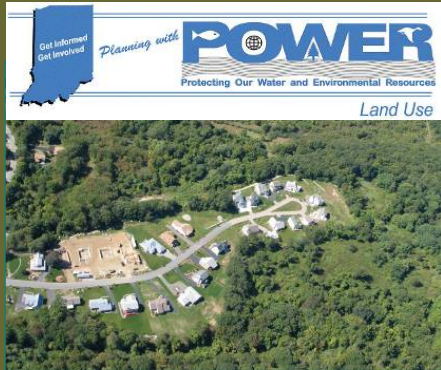
- **Zoning regulations**
- **Subdivision regulations**
- **Wetlands regulations**
- **Road ordinances**
- **Parking ordinances**
- **Landscaping ordinances**
- **Special overlays**

101

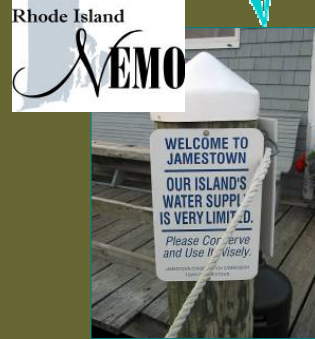
Regulations...

Examples

4



Subdivision Regulations



Special Area Overlays

5

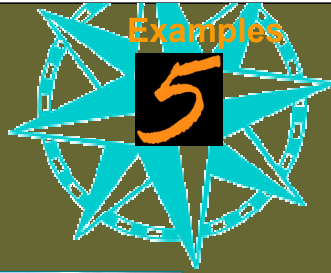
On the Ground Changes

- Overall development patterns
- Development design/LID
- Stormwater BMPs
- Open space protection
- Farmland protection
- Wetland protection



103

On the Ground . . .



Open Space Protection

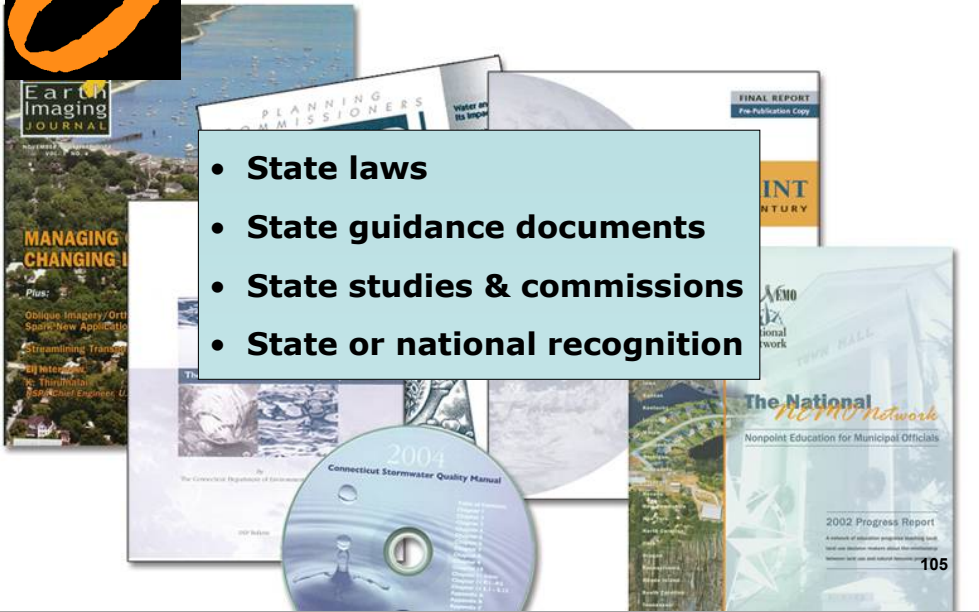


Demonstration Projects

6

Beyond Local Impacts

- State laws
- State guidance documents
- State studies & commissions
- State or national recognition



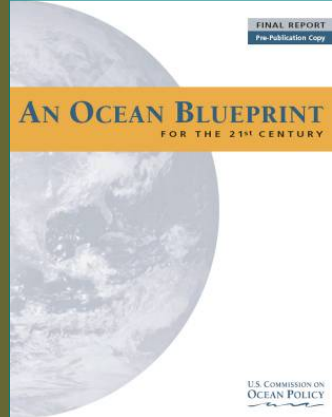
Beyond Local . . .

Examples

6



Statewide Changes



National

The National NEMO Network



NEMO University 5, October 2006



Questions? . . .



nemonet.uconn.edu

108

[Note: Photography by the NEMO Hub and National NEMO Network members, unless otherwise noted. Photographs from this presentation are reserved for National NEMO Network charter members' use in NEMO related educational materials only. Contact Kara Bonsack for information about using photographs for non NEMO related work at kara.bonsack@uconn.edu or call 860-345-5227.]

Check Out Our Next Webcast on Feb. 21st...



+



+



=

*Happy 20th Birthday, National Estuary
Program :*

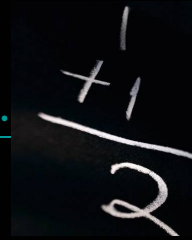
*Implementation of TMDLs and Trading
through the National Estuary Program*

109



You've seen the presentation, now tell us how it was...

Check out some additional resources...



110