

# **How Watershed Protection on the Local Level Benefits Water Quality of Long Island Sound**

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Niantic River State of the Watershed

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# Why watersheds?

These areas are, by nature, hydrologically defined. These drainage basins are the most logical approach for managing water resources.

The **resource** becomes the focal point, and provides a more complete understanding of overall conditions and the stressors that affect those conditions.

**Watershed Management really comes  
down to  
Land Use Management**

Which in Connecticut generally comes down to day-to-day actions occurring in 169 municipalities. That includes East Lyme, Montville, Salem and Waterford.

# Long Island Sound Study

A cooperative effort developed between US EPA, New York and Connecticut and others (1985).

Early on, this partnership saw the **value** of addressing water quality at the local level.

One of the first LISS action steps was to support development of the NEMO program in Connecticut (1991-2).

Waterford – first town to work with NEMO (1994).

Town required BMPs for development along with monitoring for performance.

Incorporated NEMO water quality concepts into land use regulations and POCD.

Successful water quality BMP and regulation work in Waterford led to EPA choosing that town for the site to conduct a 10 year national urban water monitoring research project.





Jordan Cove Urban Watershed Sec.  
319 National Monitoring Program







Reason for LISS investing in such work as the Jordan Cove project:

If stormwater can be treated, filtered, and/or infiltrated on-site, it takes pollution out of larger waterbodies including Long Island Sound.

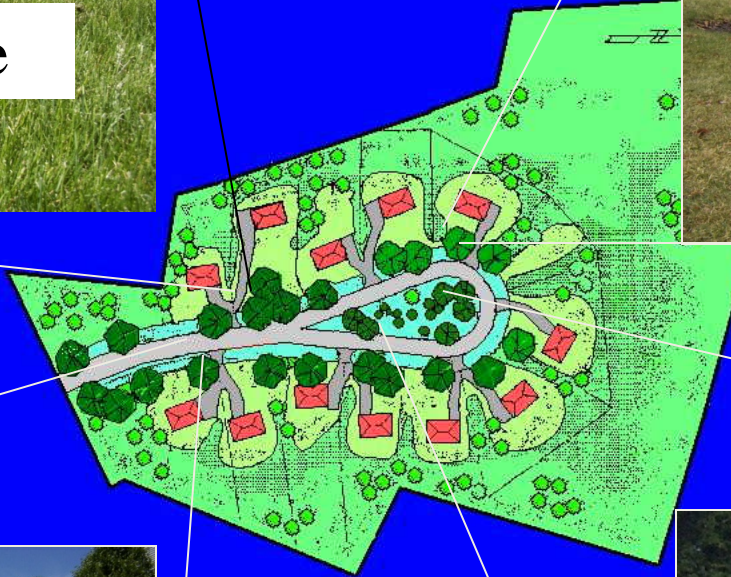
# Best Management Practices (BMPs)



Grassed Swale



Rain garden



Permeable pavers



Bioretention cul-de-sac

**A key research project outcome** – you CAN work with a developer and town to implement BMPs to improve water quality to receiving waters (Jordan Brook and LIS).



LISS in terms of nutrients –  
Encourages local IWW agencies to  
protect inland wetlands for uptake of  
nutrients and sediments.

Preserve and restore **inland wetlands**  
is a very important tool to protecting  
water quality of LIS.

LISS Estuary program has continued to support local staff and commissioner training in **erosion and sediment control** – to reduce nutrient and sediments.

This is also valued by managers and users of marinas, ports and navigation channels.

- LISS Estuary program has utilized funding through the LIS Futures Fund for **locally-led watershed planning** and strategic implementation projects.

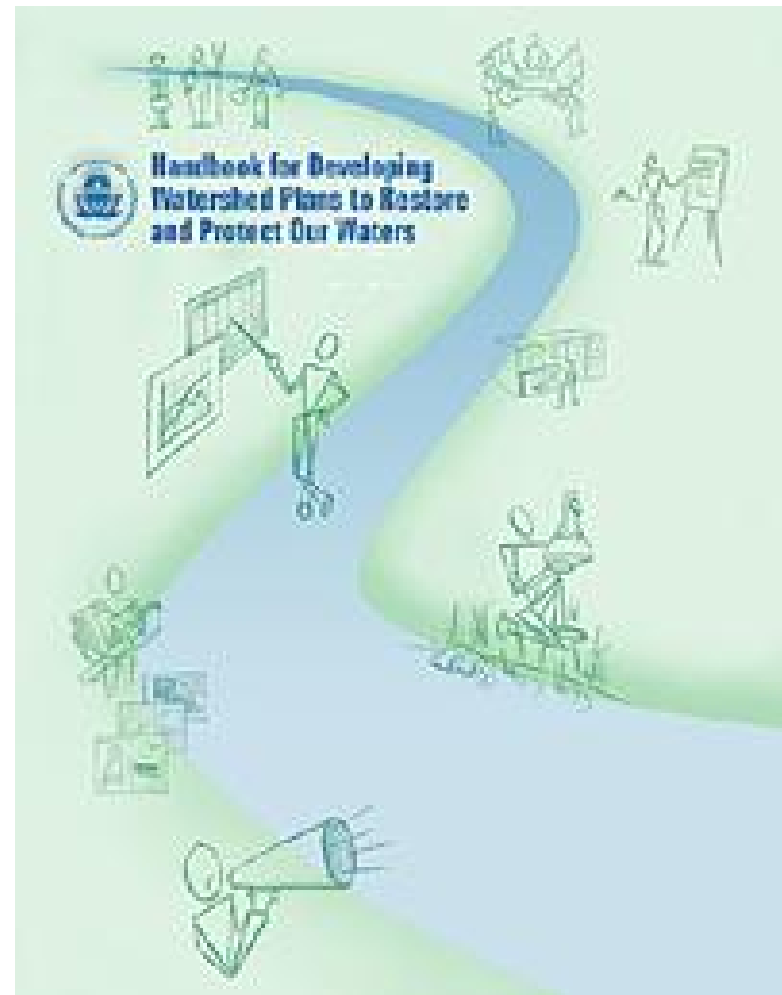
### Recent CT projects:

Tankerhoosen River watershed planning;  
Eightmile River – stormwater mngt priorities;  
CT Sea Grant – coastal riparian buffer program;  
Lord Cove coastal forest restoration



# Nine Elements in Watershed Based Plans

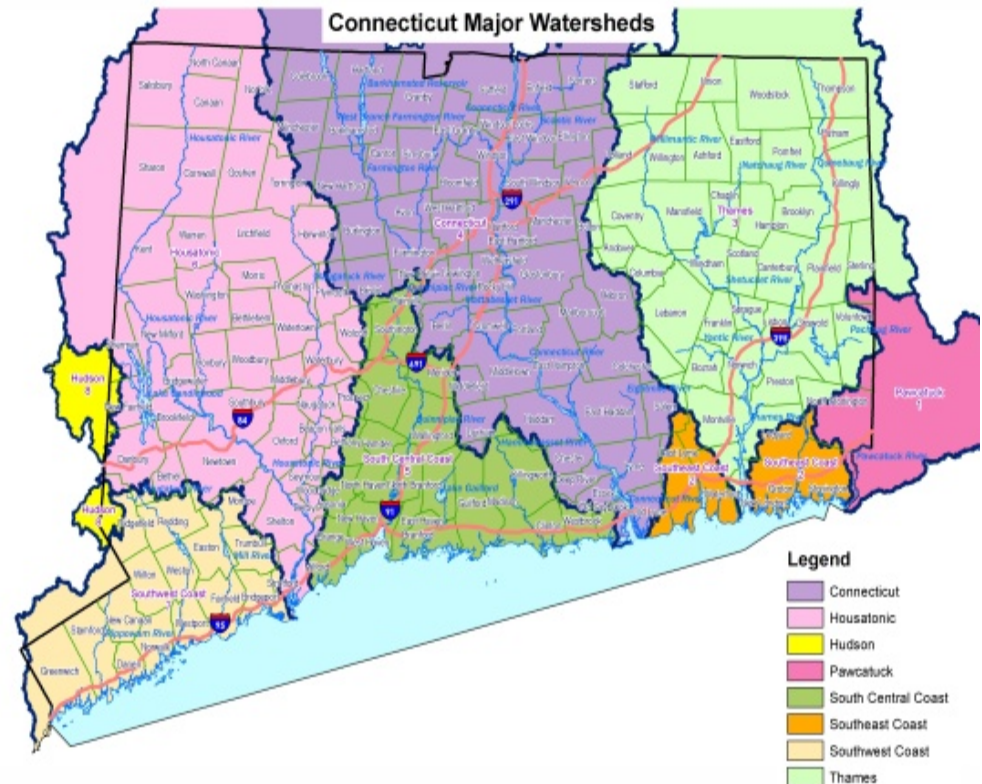
- Impairment
- Load Reduction
- Management Measures
- Technical & Financial Assistance
- Public Information and Education
- Schedule
- Milestones
- Performance
- Monitoring



# Watershed-based Plans Approved in CT

**Niantic River**  
**Coginchaug River**  
**Broad Brook**  
**Steele Brook**  
**Little River/Muddy Brook**  
**Tankerhoosen River**  
**N. Branch Park River**  
**Eagleville Brook**  
**Baker Cove**  
**Mashamoquet Brook**  
**Norwalk River**  
**Sasco Brook**  
**Pequonnock River**  
**Byram River**  
**Mianus River**

And more by end of 2012.



Long Island Sound Study has also funded Center for Land Education and Research (CLEAR) at the University of Connecticut

To analyze development of Impervious Surface (IS) and land use changes over a 20+ year period (1985-2006+)



LISS also funded CLEAR to develop Web-based information products for communities involved in watershed planning.

- CLEAR completed a report in 2008 to help communities assess the effectiveness of regulations to protect vegetated buffers around waterways.
- LISS has created a River and Stream Bank Restoration (riparian) toolbox to provide local resource managers with information about managing vegetated buffers.

# Retrofits in Action – monitoring effectiveness

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# Students assisting with modular green roof installation, UConn Storrs campus, 2009.





# Effect of a Modular Extensive Green Roof on Stormwater Runoff and Water Quality

Bruce Gregoire and John Clausen

University of Connecticut, Department of Natural Resources and the Environment



Green roofs offer the potential to mitigate some of the effects of increased impervious surfaces in urban areas. Research on the effectiveness of green roofs to reduce runoff and improve water quality has seen mixed results. The objective of this project was to evaluate the effect of a modular green roof system in the northeastern United States on stormwater runoff and water quality for nutrients, and total and dissolved metals.

# Long Island Sound Study Action Agenda 2011-2013

Theme: **Waters and Watersheds**

Goal: Promote sustainable practices on land and in the water to improve the quality of watersheds and Long Island Sound.

# Here is the Rationale –

Healthy watersheds allow for clean waters that support abundant wildlife and provide for recreational and commercial fisheries.

- Assist local decision makers in implementing existing land use protection programs.
- Public outreach and education must promote a greater understanding of the importance of healthy waters and watersheds, and encourage the public to become part of the solution.

**Infrastructure is maintained and enhanced to reduce pollutant loads.**

Achieve nitrogen reduction targets to LIS from point and nonpoint sources – defined by the TMDL for Dissolved Oxygen in LIS(2000).



Support enhancement of pumpout facilities and their use by the boating community to comply with the No Discharge zone designation for LIS.

New York just adopted NDA for remaining portions of Long Island Sound. CT had adopted NDA for the entire Connecticut coastline in 2006.

Work with the boating community to support clean marina practices to reduce sources of toxic contaminants.

Coming soon – an updated, online guide from Connecticut's Clean Vessel program.

Develop and/or promote guidance to residential and municipal landowners and service/product providers for sustainable land care practices.

This includes non-agricultural turf fertilizers and lawn alternatives.

This includes riparian buffer design using native plant species.

# Improve the performance of on-site wastewater treatment systems

This includes promoting on-site waste management programs involving regular inspections and maintenance of on-site wastewater treatment systems.

Identify structural BMPs and source control actions that are effective at reducing pathogens.

Actions can include pet waste pick up laws, nuisance wildlife control programs.

Actions will include source tracking to better target BMP placement.



Utilize the LIS Futures Fund to canvas towns adjacent to LIS or its embayments for BMP/restoration activities already completed.

This will include assessing improvements in water quality or habitat resulting from existing work. (Tell us what you have done!)

Develop and/or promote guidance  
for non-agricultural turf fertilizer  
and pesticide use.

This will include implementation through best  
management practices and can be promoted  
through education, outreach and legislation.

# **Low Impact Development and redevelopment will maintain or restore the watershed's hydrologic and ecological functions.**

Includes promoting watershed planning efforts to reduce runoff volume and pollutant loads from development. Encourage towns to adopt a “no net increase in runoff” approach.

Promote green storm water infrastructure projects in towns and at large facilities.