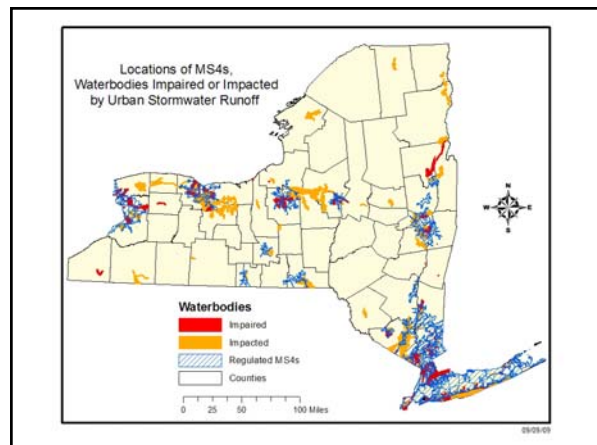
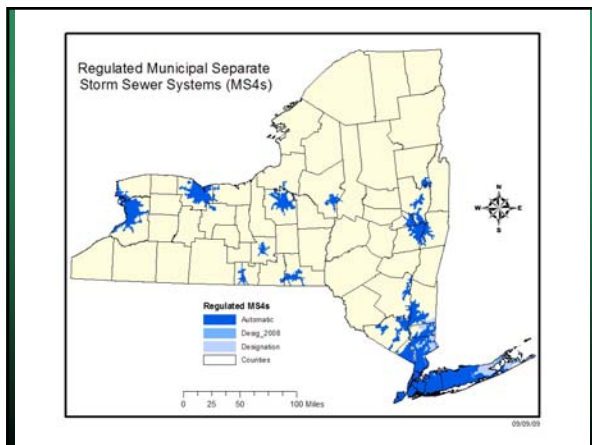
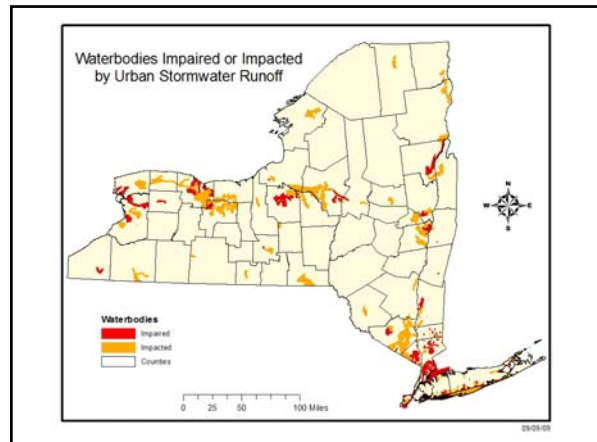


## Enhanced Stormwater Controls for Impaired/Reasonable Potential Waters

NYSDEC  
January 21, 2010

NYS Department of Environmental Conservation



## Background Enhanced Permit Requirements to Address Water Quality Impairments

- Additional, enhanced, tiered (varying levels of requirements) BMPs
- Address specific pollutants of concern (Phosphorus, Nitrogen, Pathogens)
- Apply in defined watersheds (not statewide)
- Included to address a reasonable potential to cause or contribute to a violation of water quality standards

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## Explicit, enhanced/additional BMPs

- Stormwater Retrofits
- On-site Septic Inspection, Maintenance and Rehabilitation (5/1/2011 for EOH, Greenwood Lake, Oyster Bay, Peconic)
- Compliance with Enhanced P Removal Standards or Equivalent (9/30/2008 for EOH, Onondaga, Greenwood Lake)
- E&SC Plans for 5000 sq ft to 1 acre (EOH)
- Map Entire Storm Sewer System (EOH)

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## Explicit, enhanced/additional BMPs

- ❑ Leaf and yard waste control requirements (EOH)
- ❑ Explicit storm sewer system maintenance requirements (EOH)
- ❑ Enhanced Public Education Program (EOH, Onondaga, Greenwood Lake, Oyster Bay, Peconic)
- ❑ Pet Waste Control (Oyster Bay, Peconic)
- ❑ Goose Population Management (Oyster Bay, Peconic)



## Retrofits

- Retrofits are modifications or additions to existing infrastructure to reduce pollutant loadings. Examples:
  - Better Site Design Approaches
  - Storm Sewer Rehabilitation
  - Stabilizing Dirt Roads
  - Conversion of Dirt Parking to Pervious Pavement
  - Conversion of Dry Ponds to Detention Ponds or Wetlands
  - Converting Abandoned Buildings to Open Space or SMP
  - Control of Downstream Erosion Effects
  - Direct Control Erosion Effects (Plunge Pool, Velocity Dissipaters)
  - Upgrade of Existing Conveyance to Provide Quality and Quantity Control
  - Reforestation



## Retrofit Permit Requirements Considered, but not Included

- ❑ Retrofit Percentage of Impervious Area
  - Accounting Difficult
  - Does not Address Loads From Pervious Areas
- ❑ Retrofit a set Number of Projects per MS4
  - Could be only Small Projects
  - Not Equitable
- ❑ Retrofit a Number or Percentage of Outfalls
  - Would Treat Low Loading Outfalls
  - Would focus on end of pipe



## Retrofit Permit Requirements in April, 08 MS4 Permit

- Identify sites with problems
- Choose projects based on:
  - Pollutant reduction potential
  - Use of proven technologies
  - Economic feasibility
- Procedures for design, permits, funding, O&M
- Approvable plans, schedules and funding sources



## EPA Retrofit Document Urban Stormwater Retrofit Practices – August, 2007, Center for Watershed Protection

To register and download go to:

[http://www.cwp.org/formmaker/Download-Form\\_RedirectFormPage.html](http://www.cwp.org/formmaker/Download-Form_RedirectFormPage.html)

It will be Manual 3 – Urban Stormwater Retrofit Practices



## EPA Retrofit Document Urban Stormwater Retrofit Practices – August, 2007, Center for Watershed Protection

- Basics of Retrofits
- Identifying Candidates for Retrofitting
- Options for Retrofitting (More traditional practices)
- Assessment Process (Retrofit Recon- Investig)
- Simple Method/Point System to assign load reductions
- Unit Costs , Design Sheets, and Infiltration Testing



## DEC Retrofit/Modeling Paper

- ❑ Basis for Retrofit Section of EOH TMDL Implementation Plan
- ❑ Short term expectations: simpler retrofits
  - converting ditches to dry swales
  - erosion repairs and disconnecting rooftops
  - ~0.3 - 0.5 lb/acre/yr reductions
- Long term expectations: sophisticated, targeted retrofits
- Load reductions for retrofits assigned using engineering analysis - e.g. WTM or Win-SLAMM



## Other Key Points

- ❑ Older TMDLs do not distinguish MS4 loads from non-point source (no MS4 WLAs)
- ❑ MS4 load reduction would be achieved with Retrofits and non-structural BMPs
- ❑ Triggers for retrofits may also include Redevelopment or routine system upgrades



## East of Hudson TMDL Implementation Plan

- ❑ TMDL Implementation Plan required for EOH TMDL
- ❑ First deadline for retrofit plan in EOH
- ❑ Implementation plan provides direction for what would be approvable
- ❑ Follow similar process for other watersheds



## East of Hudson TMDL Implementation Plan Concepts

- ❑ Watershed wide total annual mass reduction
- ❑ Allocate reductions by MS4 and Sub-watershed based on high intensity development acreage
- ❑ Allow for bubble or individual load reductions
- ❑ Reductions credited based on modeling of projects
- ❑ Establish timing for retrofits
- ❑ DEC Re-evaluate every five years using ambient monitoring data to determine if plan must be modified



## Challenges

- ❑ Costs and getting Stormwater Projects on the State Revolving Fund Intended Use Plan
- ❑ Affordability and Public Acceptance of Need
- ❑ Apportioning Costs
- ❑ Identifying and prioritizing projects
- ❑ Time required for planning and design
- ❑ Cooperation and coordination
- ❑ Establishing a reliable relationship between calculated load reductions and ambient water quality



## Challenges

- Establishing quantifiable metrics for measuring progress towards goals
- MS4 Effectiveness/Cost Effectiveness Assessment
- Individual Project Effectiveness Evaluation
- DEC Re-evaluating Retrofit Program Effectiveness
- Technology Limitations
- Siting issues - access to or long term control over non-public property



## On-site Systems

- On-site septic inspection, maintenance and rehabilitation every 3 years (EOH, Greenwood Lake, Oyster Bay, Peconic)
- On-site as a pollutant source
  - 1 kg P /y/failed system
  - 4 kg N/y/failed system
  - Total Coliforms  $10^8$  to  $10^{10}$  MPN/100 ml (1M BC/Y)
- EPA On-site Management Handbook <http://cfpub.epa.gov/owm/septic/index.cfm>
  - Five Levels of Management Models
  - Most basic: inventory of systems, inspection service tracking, homeowner based
  - More advanced: Regional Management Entity, Professional Inspections

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## Enhanced P Removal Standards (EOH, Onondaga, Greenwood Lake)

- Developed sites as a pollutant source (Generalized/Simple)
  - 1 lb P /5 acre/y forested/open land
  - 5.1 lb P/5 acre/y/developed to 21 % impervious (untreated)
  - 2.5 - 3 lb P/5 acre/y/developed with standard treatment
  - 1 lb P/5 acre/y/ developed with enhanced standard (goal)
  - 300 acres forested open land developed – 90 lb P/y differential between standard and enhanced.
- Enhanced Standards [http://www.dec.ny.gov/docs/water\\_pdf/dpremoval.pdf](http://www.dec.ny.gov/docs/water_pdf/dpremoval.pdf)
  - Treat one year storm
  - Evaluate and implement hydrologic source control where feasible

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## ESC Plans for 5000 sq ft Sites (EOH)

- Construction site as a pollutant source (RUSLE, Syracuse, Silt-Loam, 8 %, 100 ft slope length)
  - 1.5 tons soil/acre/3 mo stabilized
  - 25 tons soil /acre/3 mo/under construction (uncontrolled)
- Appendix E to NYS Standards and Specifications for Erosion and Sediment Control [http://www.dec.ny.gov/docs/water\\_pdf/appendixeesc.pdf](http://www.dec.ny.gov/docs/water_pdf/appendixeesc.pdf)

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## Map Entire Storm Sewer System (Complete by January 8, 2013 in EOH)

- Illicit Discharge Detection and Elimination Manual [http://www.cwp.org/Resource\\_Library/Controlling\\_Runoff\\_and\\_Discharges/idde.htm](http://www.cwp.org/Resource_Library/Controlling_Runoff_and_Discharges/idde.htm)

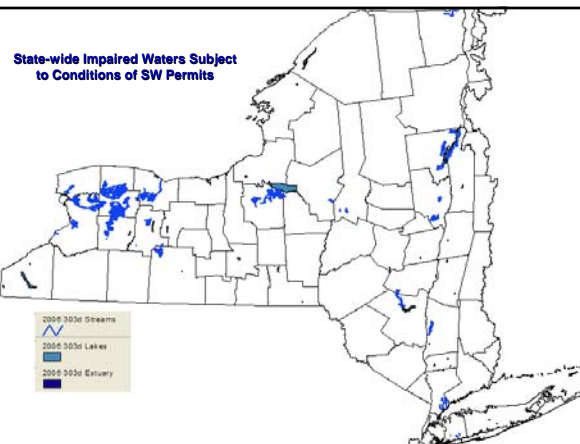
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## Impaired Waters Modeling/No Net Increase

- For *Discharges* of a pollutant of concern (POC) to *impaired* waters listed in Appendix 2
  - MS4s must demonstrate (modeling) no net increase in its discharge of the listed POC to the impaired water
  - By January 8, 2013, assess the progress and evaluate *SWMP* effectiveness
- Required modeling to demonstrate loading decreases for watershed improvement strategy areas
- Karimipour modeling paper as Appendix D [http://www.dec.ny.gov/docs/water\\_pdf/ms4rsappend.pdf](http://www.dec.ny.gov/docs/water_pdf/ms4rsappend.pdf)

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## Leaf and yard waste control requirements (EOH)

- Decaying leaves on impervious areas can be up to 50% of the phosphorus load
- DEC Minimum Measure 6 Assistance Document  
[http://www.dec.ny.gov/docs/water\\_pdf/mppaf.pdf](http://www.dec.ny.gov/docs/water_pdf/mppaf.pdf)
- Center for Watershed Protection PP/GH Guidance  
[http://www.cwp.org/formmaker/Download-Form\\_RedirectFormPage.html](http://www.cwp.org/formmaker/Download-Form_RedirectFormPage.html)



## Alternatives for Leaf Pick-up

- Targeted Street Sweeping
- Bagging
- Timing for Pick-up
- Other



## Sewer System Maintenance

- Explicit storm sewer system maintenance requirements (EOH)
  - Spring and Fall Catch Basin Inspections
  - Clean at 50 % capacity
- DEC Minimum Measure 6 Assistance Document  
[http://www.dec.ny.gov/docs/water\\_pdf/mppaf.pdf](http://www.dec.ny.gov/docs/water_pdf/mppaf.pdf)
- Center for Watershed Protection PP/GH Guidance  
[http://www.cwp.org/formmaker/Download-Form\\_RedirectFormPage.html](http://www.cwp.org/formmaker/Download-Form_RedirectFormPage.html)



## Maintenance Alternatives

- Create Priority Areas for More Frequent Inspections (e.g. high traffic, proximity to drainage/waterbodies)
- Other



## Enhanced and Targeted Public Education Program

- In one study, a public education program resulted in 40 percent of homeowners forgoing Spring application of phosphorus fertilizer
- EPA Non-point source outreach toolbox  
<http://www.epa.gov/nps/toolbox/>
- DEC Partnership Section



## Public Education Alternatives

- State funding more education tools
- Other



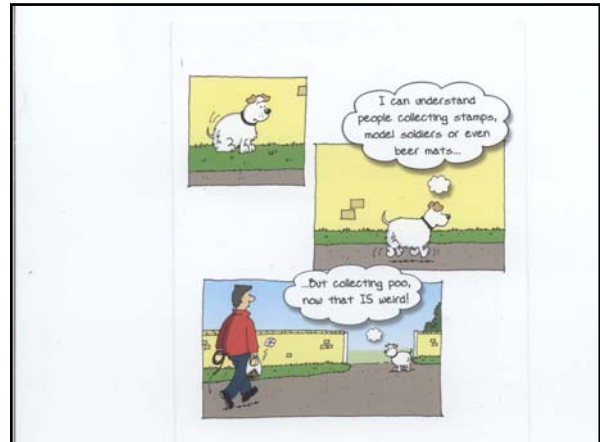
## Goose Population Management (Peconic, Oyster Bay)

- Research has shown that up to 95% of the fecal coliform found in stormwater comes from animals
- Examples: No feeding, allow hunting, Longer grass/shrubs, Grid Wires, Fencing, scaring devices, goose repellants, dogs, egg puncturing, shaking, freezing, corn oiling

[http://www.dec.ny.gov/docs/wildlife\\_pdf/when\\_geese\\_become\\_a\\_problem1.pdf](http://www.dec.ny.gov/docs/wildlife_pdf/when_geese_become_a_problem1.pdf)

<https://epermits.fws.gov/eRCGR>

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## Pet Waste Control

- Pet Waste Control Requirements (Oyster Bay, Peconic)
  - Pet waste bag program
  - Law prohibiting pet waste on municipal properties
- Animal waste as a source of Pathogens
  - Average size dog dropping produces 3 billion coliform bacteria
  - Research has shown that up to 95% of the coliform found in stormwater comes from animals
  - A new national survey shows that 38% of dog owners don't clean up after their pets.
- Waldwick Example Law <http://www.waldwickpd.org/code/Chapter%2068.pdf>

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## New Standards to Include Green Infrastructure

- Requires a portion of new development to address stormwater with GI
- Makes a suite of new practices Design Manual Compliant
- Seeking Chapter 5 comments by February 3, 2010

<http://www.dec.ny.gov/chemical/41392.html>

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## New York State 303(d) and TMDLs under Clean Water Act

- Statewide waters monitoring program
- Waterbody inventory
- CWA Section 305(b) - Priority Waterbody List
- CWA Section 303(d) – Impaired segments
- CWA TMDL – plan for getting unimpaired

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## Development Impacts Water Resources

In New York State, stormwater from development impairs:

- 1970 miles of streams and rivers
- 244 square miles of lakes and reservoirs
- 725 square miles of estuaries

Source: NYS DEC's 2008 305(b) report

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## New York Water Impairment Listings

- ❑ 52 % Atmospheric Deposition
- ❑ **27 % Storm Runoff from Developed Areas**
- ❑ 12 % Municipal Sewage
- ❑ 11 % CSOs
- ❑ 5 % Onsite Systems
- ❑ 4 % Agricultural

Source: NYS DEC's 2008 305(b) report. Note some overlap



## 30 Year Trends Report Macro-invertebrate Studies

- ❑ Impacted Sites
  - **52 % from Non-Point Sources**
  - 15 % from Complex Municipal/Industrial
  - 11 % from Sewage and Animal Wastes
  - 6 % from Toxicity
  - 6 % from Impoundment
  - 5 % from Siltation
  - 5 % Undetermined



## Stormwater from Developed Areas in New York

- ❑ Stormwater runoff from developed areas is consistently identified among the most significant causes of water quality impairment.
- ❑ 60% of total area of estuary waters, 30% of lake acres, 7% of river miles have adverse water quality impacts for which urban stormwater runoff is the primary or secondary cause.
- ❑ New York State beaches (coastal and Great Lakes) had 1,610 closing and advisory days in 2008.
  - 1,355 days due to stormwater from developed areas
  - 328 days due to CSOs



## CWA Delegation Requirements for Stormwater



- ❑ 1987 Federal Clean Water Act
- ❑ EPA Stormwater Regulations - Phase I / Phase II
- ❑ Title 40 Code of Federal Regulations (CFR) Parts 122-124 (122.26)
- ❑ NYS State Pollutant Discharge Elimination System (SPDES) ECL Article 17 DEC Regulations 6NYCRR
- ❑ NYS DEC is "permitting agency"



## Federal Stormwater Regulations

- ❑ Phase I promulgated in 1990
  - Industrial activities
  - Large municipalities
  - Construction disturbing >5 acres
- ❑ Phase II promulgated in 1999
  - Construction disturbing >1 acre
  - Expanded scope of regulated activities
  - Smaller municipalities (based on census), schools, universities



## Clean Water Act Stormwater Implementation in New York – General Permits

- ❑ Phase I Permits
  - Industrial Stormwater, 1993 General Permit, 1998 Renewal, 2006 Renewal
  - Construction over 5 Acres, 1993 General Permit, 1998 Renewal
  - Large MS4s (NYC), 1994
- ❑ Phase II General Permits Issued in 2003
  - Construction
  - MS4
- ❑ Phase II General Permits Renewed in 2008



## NYSDEC CWA Construction Stormwater Permit

- Stormwater Pollution Prevention Plan (SWPPP)
- File a Notice of Intent (NOI) - Await Review Period
- NOIs submitted to Albany
- When required, SWPPPS submitted to Region

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## The Federal government recognizes that local government controls land use & development



- EPA requires MS4 communities to control the potential impacts of stormwater at the local level
- Localities already review site plans, drainage
- Solution: NYS General Permit for MS4s requires adoption of a local law or other regulatory mechanism for three categories of activities relating to 3 of the minimum measures of control ...

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## Federal MS4 Program

- Develop, implement, and enforce a SWMP
- Six Minimum Control Measures (MCMs):
  - Public Education and Outreach
  - Public Involvement and Participation
  - Illicit Discharge Detection and Elimination
  - Construction Site Runoff Control
  - Post-Construction Stormwater Management
  - Good Housekeeping
- Annual Reporting

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## Regulated MS4s Include:

- 433 Municipal Governments ("Automatic") - Vary from Larger (e.g. Buffalo) to Small (e.g. Laurel Hollow)
- 30 Additional Designated
- 53 "Non-traditionals" - e.g. DOT, Schools, Sewer Districts, Federal Facilities

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## Interaction between DEC & MS4 Construction Programs



- Coordinated MS4/DEC program
  - DEC does authorization processing (NOIs)
  - MS4 does plan review, inspections, compliance
  - Many local options but probably third party engineer plan review, stormwater management officer inspection (SWCD contract) program
  - MS4 Certification of NOIs

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## New York Specific MS4 Program:

- Municipalities Adopt New York State Model Law Equivalent - State/Local Requirements Coincide
- State Provides Stormwater Design Standards
- Localities Approve State Authorized Projects
- Available partnerships /cooperation/collaboration
- Available funding for program development
- Reporting requirements

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## Watershed Improvement Requirements in New York

- ❑ EPA Requires Evaluation of Additional Designation
- ❑ New York Requires MS4s Areas with TMDLS to address stormwater pollutants
- ❑ MS4s Model Loadings to Impaired Waters
- ❑ Watershed Improvement Requirements (to meet federal requirement to comply with WQ stds)



## Efficiencies

- ❑ Completed
  - 21 Waivers
  - Revised Annual Reporting
  - Web Based Outreach
- ❑ Potential
  - Schools Permit
  - Web Based Reporting
  - Expanded Web Based Outreach



## Funding MS4s

- Used funding to support development of MS4s stormwater management programs
  - Encouraged inter-municipal cooperation
  - Focused on pollutants of concern
  - Encouraged development of Consistent MS4 Funding
- > \$11 million awarded to date
- Budget Crisis Interrupts Grant Processing
  - Significant outcry from localities
  - Layoffs pending



## Questions

