Good Housekeeping Workshops

Merrimack Valley Stormwater Collaborative

Workshop 1 – Parks & Recreation Areas

March 9, 2015

Brian Kuchar, RLA, PE & Gary Hedman
Horsley Witten Group, Inc.

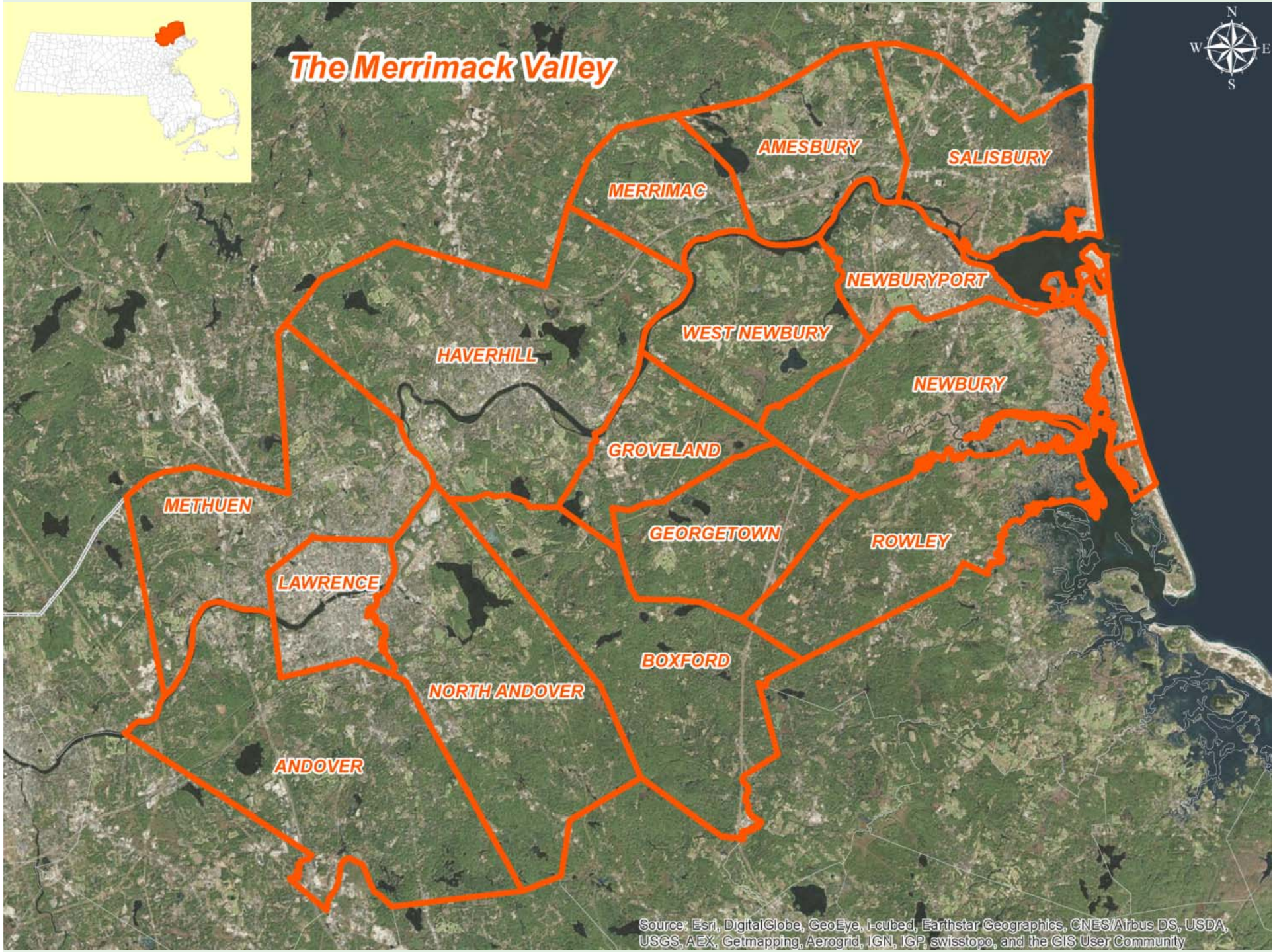
Good Housekeeping Workshop Agenda

Workshop 1 – Parks & Recreation Areas
Tuesday, March 10, 2015 (8 - 11:00 AM)
Snow date: Thursday, March 12, 2015
Northern Essex Community College - Classroom

Workshop 2: Buildings, Facilities, Vehicle and Equipment Maintenance
Friday, March 20, 2015 (8 - 11:00 AM)
Andover Public Safety Building and Public Works Maintenance Yard

Workshop 3: Stormwater Management and Infrastructure Maintenance
Friday, April 10, 2015 (8 - 11:00 AM)
Northern Essex Community College – Classroom

- Introduction
- Water quality at public parks & recreation areas
- Discussion
- Applicable regulations
- Pollution prevention practices
- Discussion / Q & A
- Opportunities for Regional Efficiencies
- Wrap up


The Merrimack Valley
AMESBURY
SALISBURY
MERRIMAC
NEWBURYPORT
WEST NEWBURY
HAVERHILL
NEWBURY
GROVELAND
METHUEN
GEORGETOWN
ROWLEY
LAWRENCE
BOXFORD
NORTH ANDOVER
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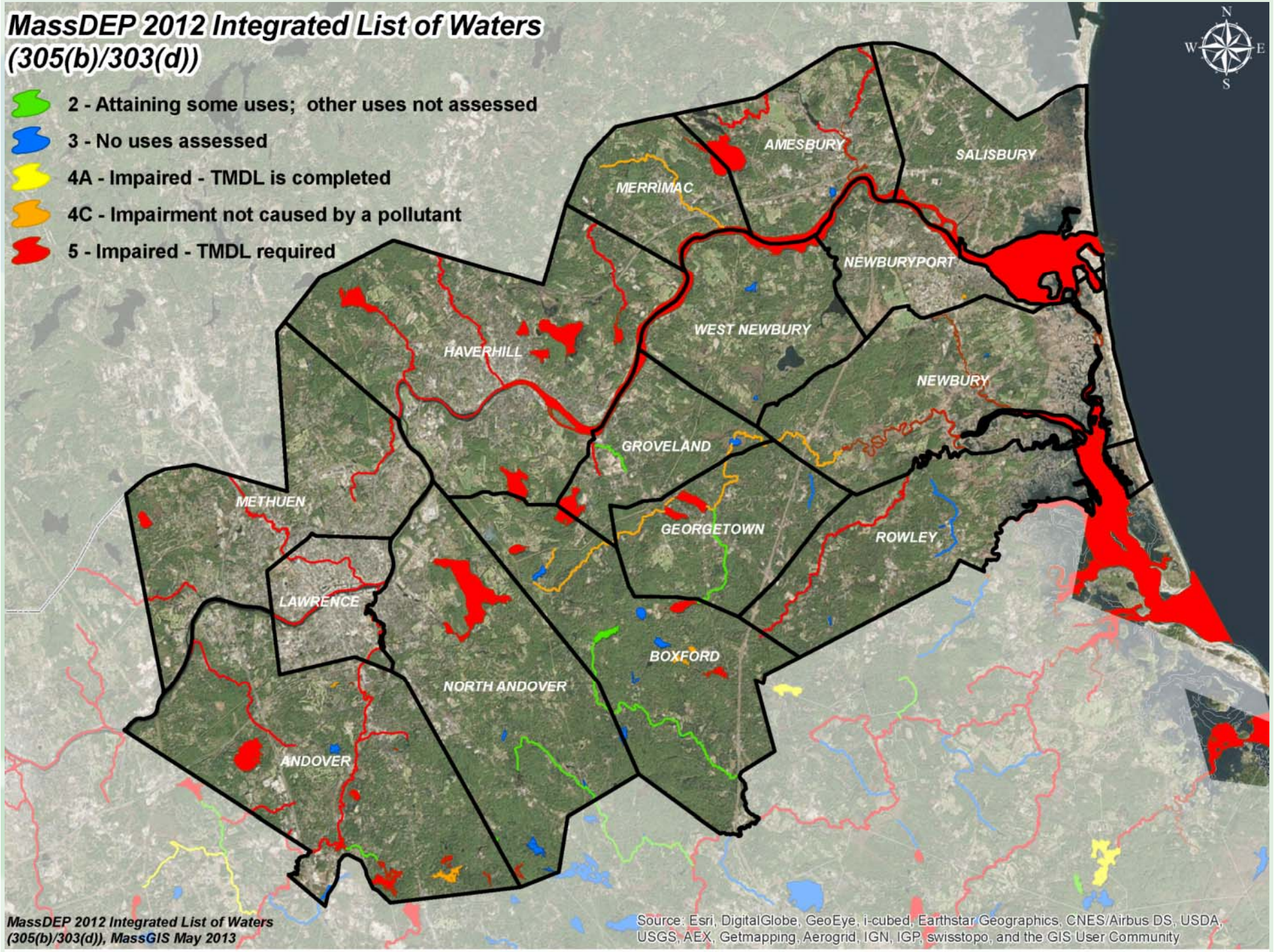
Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Do you know?

1. What % of your town is publicly-owned and covered in turf or landscaping?
2. The extent of mowing, fertilization, pesticide application, and supplemental irrigation on that land?
3. If regular park and landscape maintenance activities generate stormwater pollutants?
    1. Which ones?
4. What waterbodies your lands drain to and are they impaired for any water quality parameter?


MassDEP 2012 Integrated List of Waters
(305(b)/303(d))
2 - Attaining some uses; other uses not assessed
3 - No uses assessed
4A - Impaired - TMDL is completed
4C - Impairment not caused by a pollutant
5 - Impaired - TMDL required
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SALISBURY
MERRIMAC
NEWBURYPORT
WEST NEWBURY
HAVERHILL
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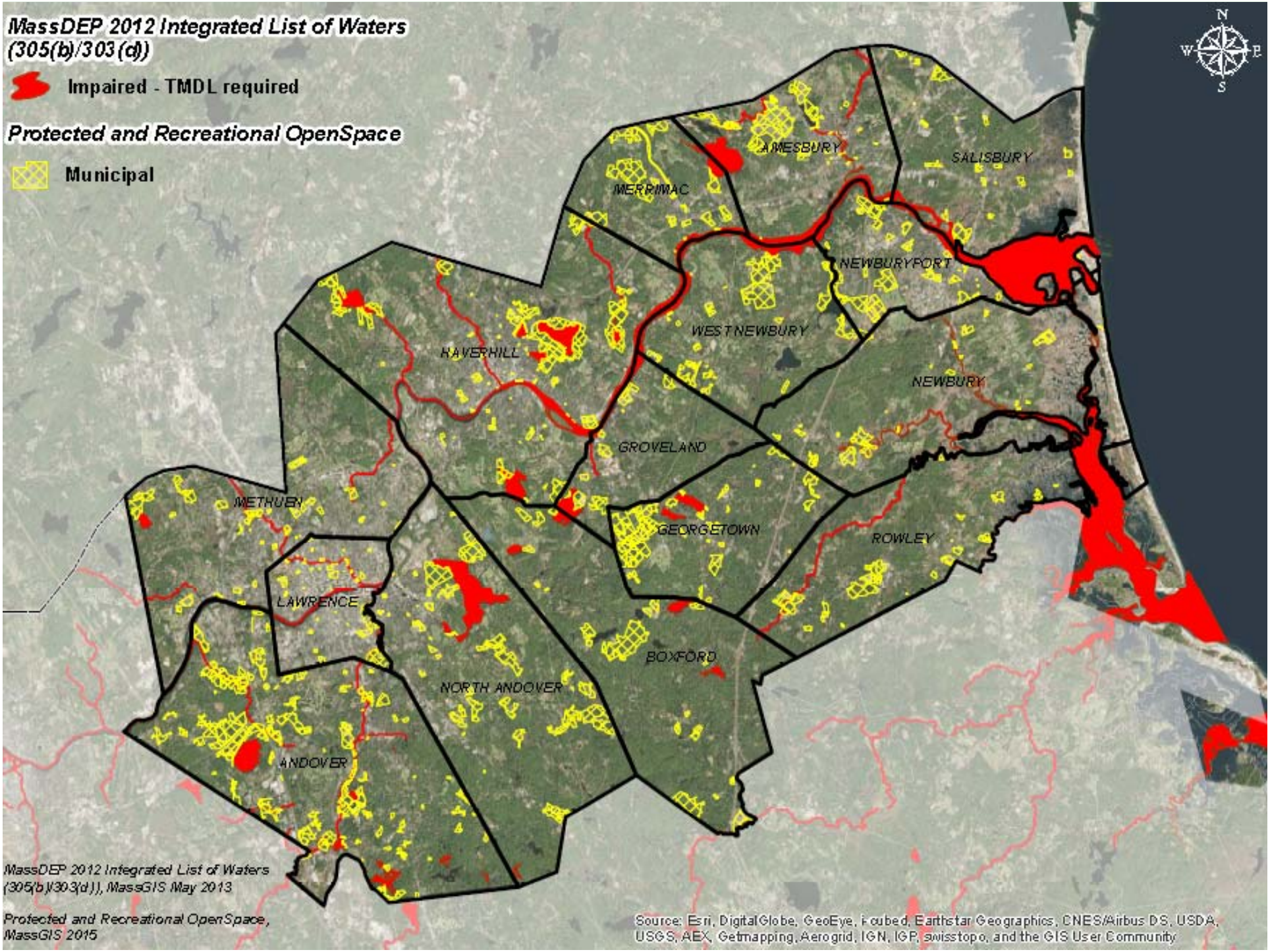
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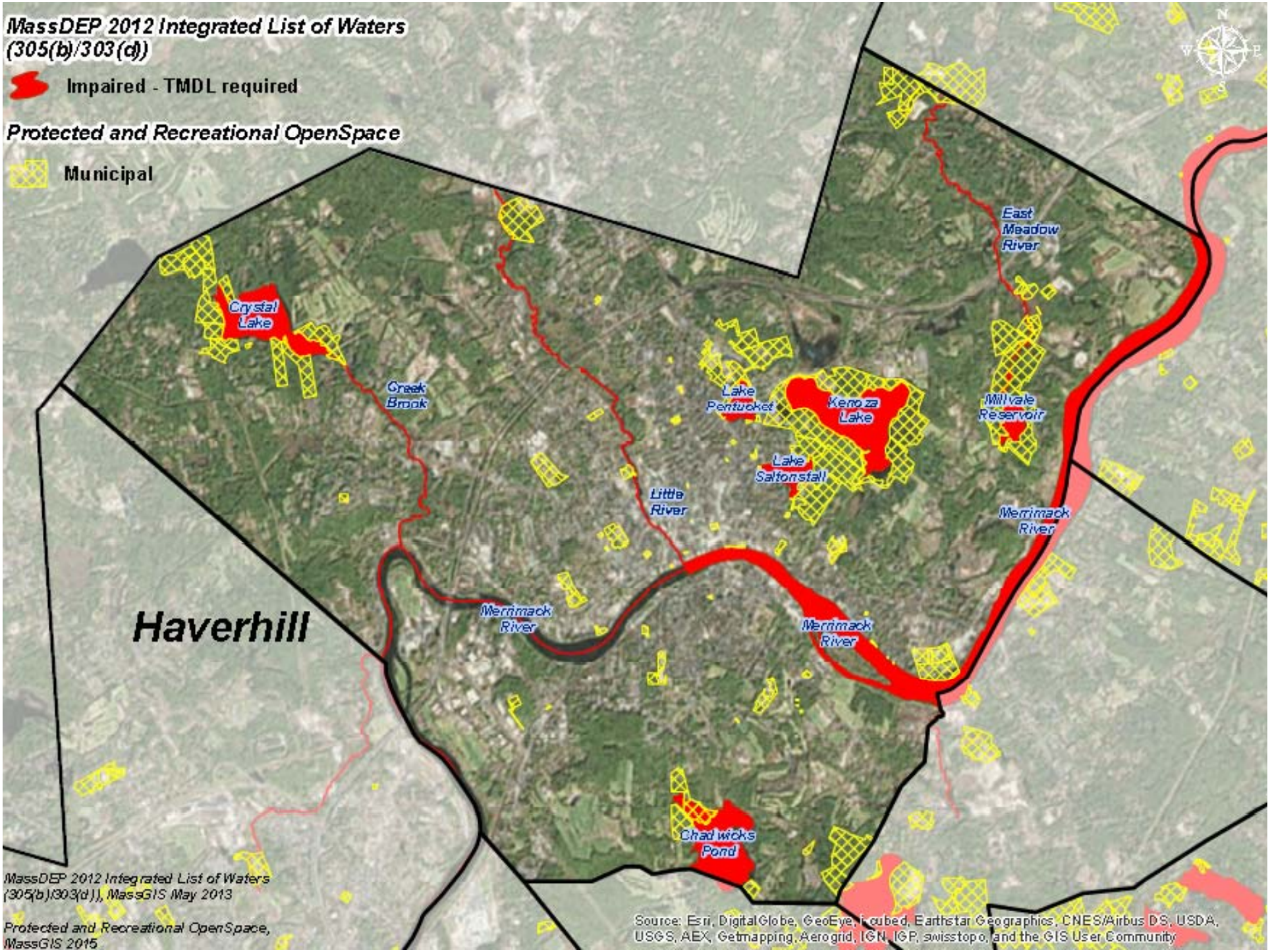
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(305(b)/303(d))
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Protected and Recreational OpenSpace
Municipal
Haverhill
Crystal Lake
Creek Brook
Lake Pentucket
Kenoza Lake
Lake Saltonstall
Little River
East Meadow River
Millvale Reservoir
Merrimack River
Merrimack River
Merrimack River
Chadwicks Pond
MassDEP 2012 Integrated List of Waters
(305(b)/303(d)), MassGIS May 2013
Protected and Recreational OpenSpace,
MassGIS 2015
Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA,
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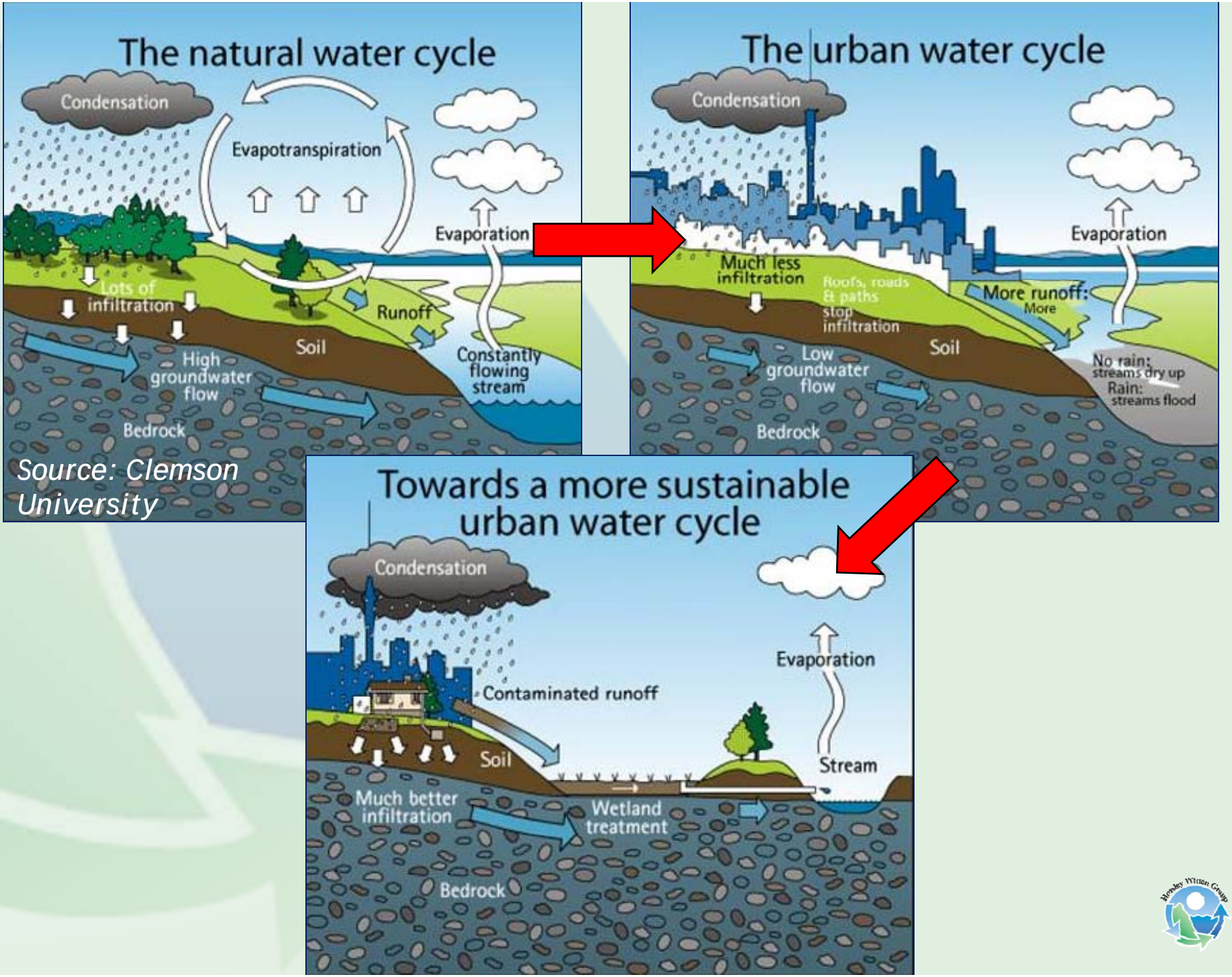
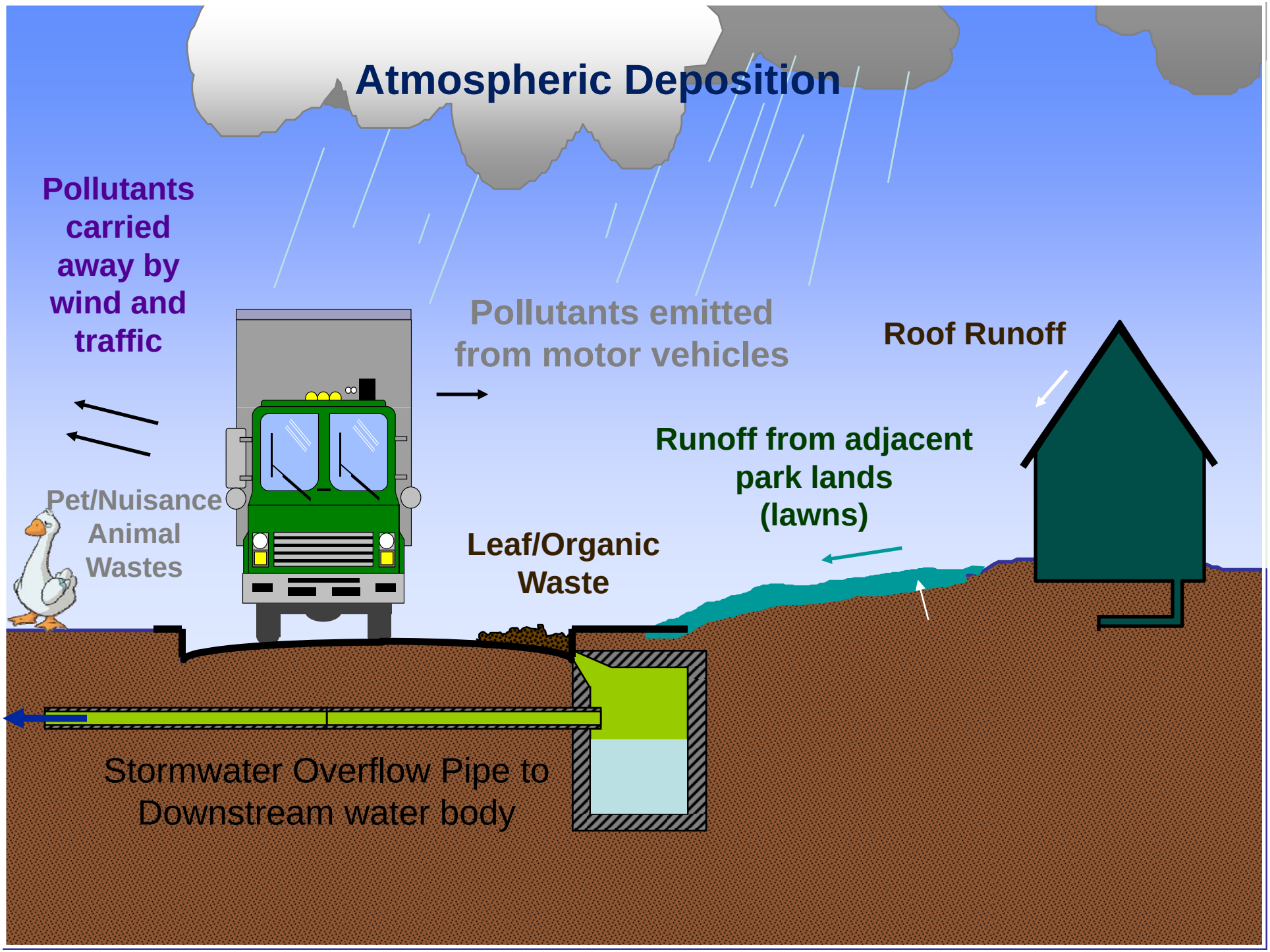


Source: Clemson University


Atmospheric Deposition
Pollutants carried away by wind and traffic
Pollutants emitted from motor vehicles
Roof Runoff
Runoff from adjacent park lands (lawns)
Pet/Nuisance Animal Wastes
Leaf/Organic Waste
Stormwater Overflow Pipe to Downstream water body

Water Quality

- Introduction
- **Water quality (25 min)**
- Discussion: Experiences from participants (15 min)
- Overview of applicable regulations (30 min)
- Description of Best Practices (45 min)
- Q & A (10 min)
- Discussion: Regional Efficiencies (15 min)
- Concluding remarks – Wrap up (5 min)


RHODE ISLAND DEPARTMENT OF HEALTH
Beach Monitoring Program
NO SWIMMING
NO SE PERMITE NADAR
PER ORDER OF THE
R.I. DEPARTMENT OF HEALTH
Beach Closure Hotline 401-222-2751
www.ribeaches.org


CLOSED AREA
NO SHELLFISHING
Due to fecal coliform bacterial contamination
PER ORDER OF
MASSACHUSETTS DIVISION OF MARINE
FISHERIES
PAUL S. MONTAGUE, SHELLFISH CONSTABLE
508-548-7611 ext. 334


Detergents
CAUTION
PESTICIDE APPLICATION
KEEP
OFF
Toxic Contaminants
Herbicides, fertilizers
Debris, Salt, Sediment, Oils & Grease
Thermal Stress
Nutrients and Pathogens

Potential Pollutants

Potential pollutants likely associated with *municipal activities*

Municipal Program	Activities	Potential Pollutants								
		Sediment	Nutrients	Trash	Metals	Bacteria	Oil & Grease	Organics	Pesticides	Oxygen Demanding Substances
Roads, Streets, and Highways Operation and Maintenance	Sweeping and Cleaning	X		X	X		X			X
	Street Repair, Maintenance, and Striping/Painting	X		X	X		X	X		
	Bridge and Structure Maintenance	X		X	X		X	X		
Plaza, Sidewalk, and Parking Lot Maintenance and Cleaning	Surface Cleaning	X	X			X	X			X
	Graffiti Cleaning	X	X		X			X		
	Sidewalk Repair	X		X						
	Controlling Litter	X		X		X	X			X
Fountains, Pools, Lakes, and Lagoons Maintenance	Fountain and Pool Draining		X					X		
	Lake and Lagoon Maintenance	X	X	X		X			X	X
Landscape Maintenance	Mowing/Trimming/Planting	X	X	X		X			X	X
	Fertilizer & Pesticide Management	X	X						X	
	Managing Landscape Wastes			X					X	X
	Erosion Control	X	X							

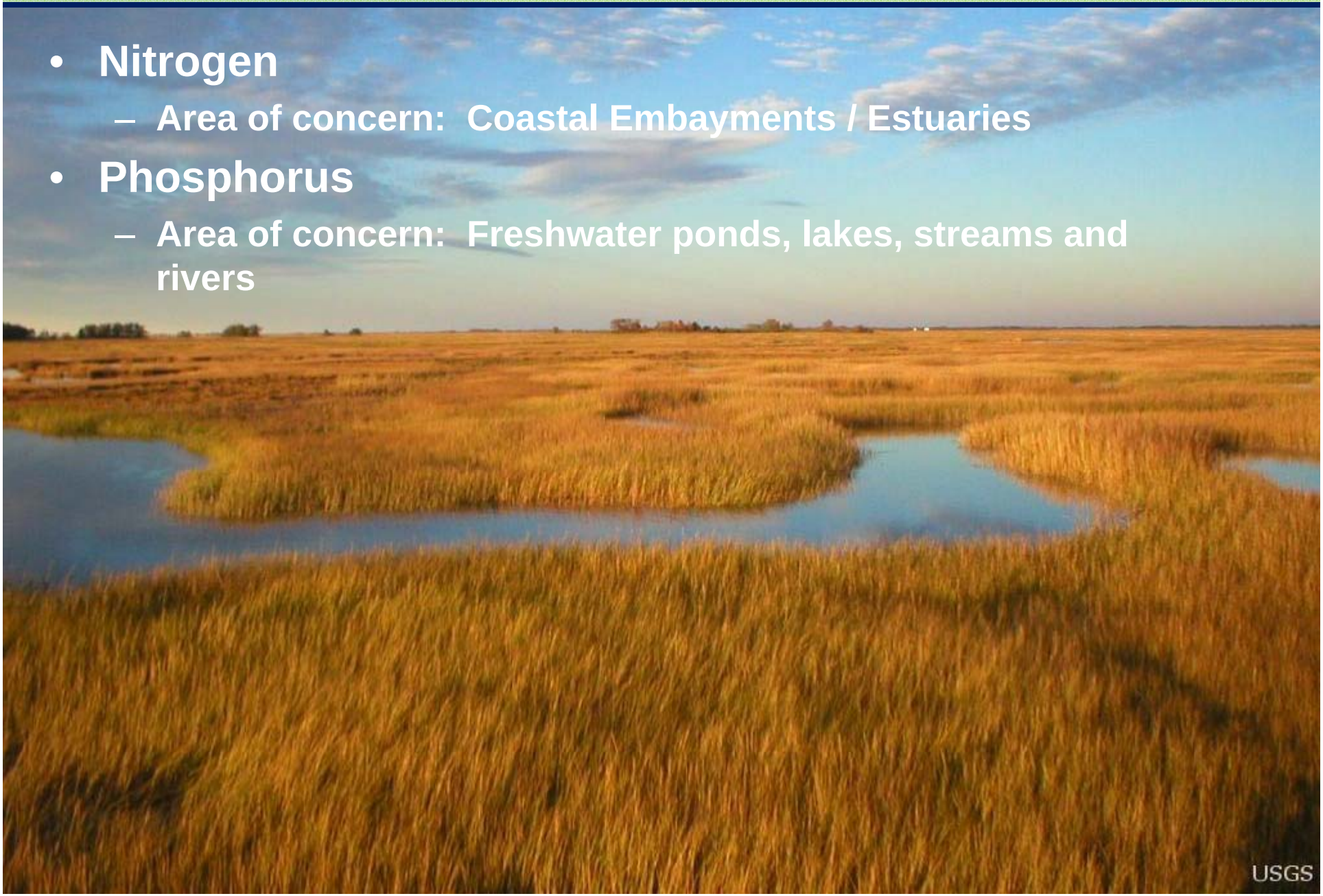
Pollutants

Potential pollutants likely associated with specific *municipal facilities*

Municipality Facility Activity	Potential Pollutants								
	Sediment	Nutrients	Trash	Metals	Bacteria	Oil & Grease	Organics	Pesticides	Oxygen Demanding Substances
Building and Grounds Maintenance and Repair	X	X	X	X	X	X	X	X	X
Parking/Storage Area Maintenance	X	X	X	X	X	X	X		X
Waste Handling and Disposal	X	X	X	X	X	X	X	X	X
Vehicle and Equipment Fueling			X	X		X	X		
Vehicle and Equipment Maintenance and Repair				X		X	X		
Vehicle and Equipment Washing and Steam Cleaning	X	X	X	X		X	X		
Outdoor Loading and Unloading of Materials	X	X	X	X		X	X	X	X
Outdoor Container Storage of Liquids		X		X		X	X	X	X
Outdoor Storage of Raw Materials	X	X	X			X	X	X	X
Outdoor Process Equipment	X		X	X		X	X		
Overwater Activities			X	X	X	X	X	X	X
Landscape Maintenance	X	X	X		X			X	X

Source: California Stormwater BMP Handbook (http://www.cabmphandbooks.com/)(slightly modified)

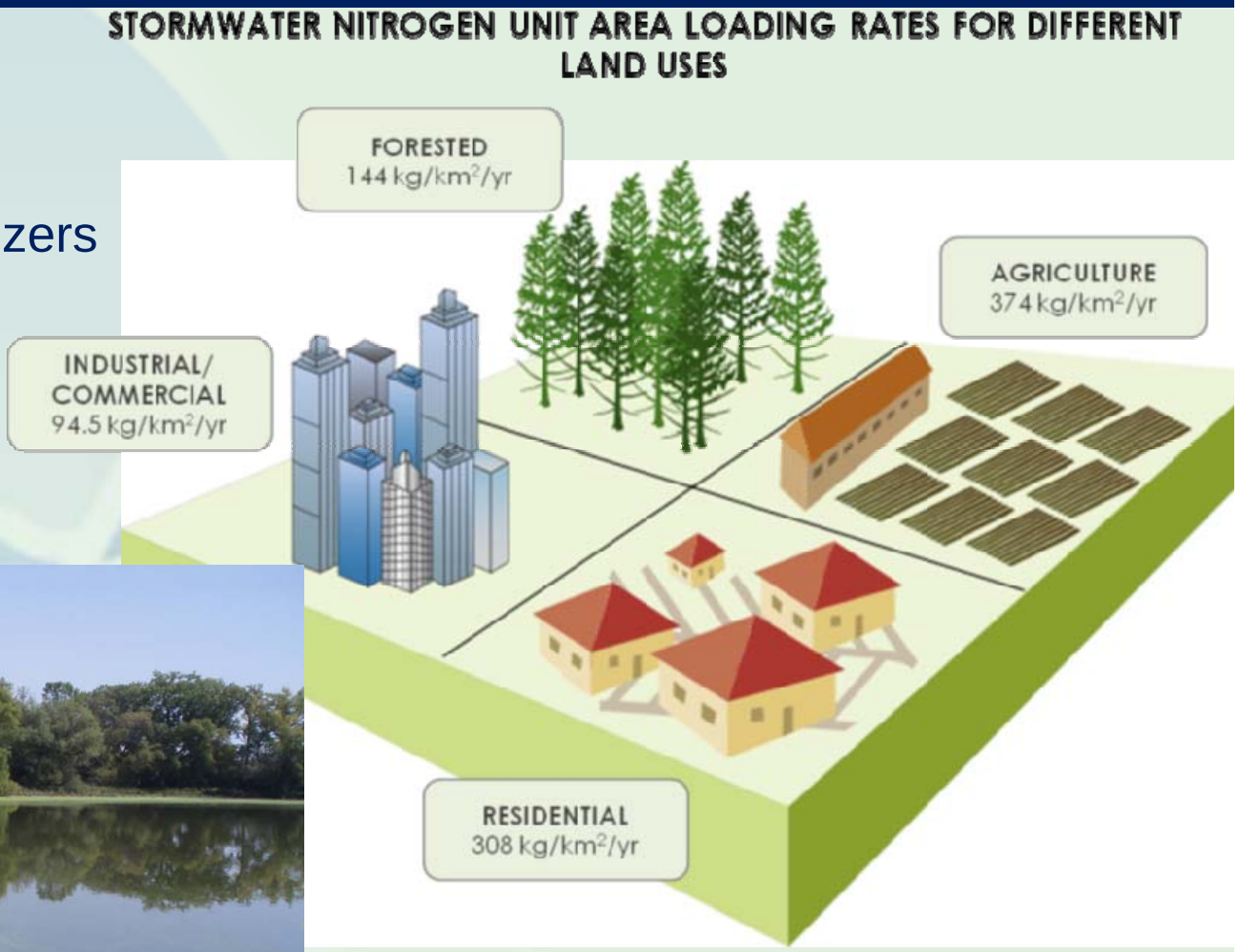
Nutrients



- **Nitrogen**
  - **Area of concern: Coastal Embayments / Estuaries**
- **Phosphorus**
  - **Area of concern: Freshwater ponds, lakes, streams and rivers**

Nitrogen

- Nitrogen
  - Sediments
  - Manufactured fertilizers
  - Compost, peat and manure
  - Certain soaps and detergents



Phosphorus

- Phosphorus
  - Sediment
  - Fertilizers
  - Decaying plant material/leaf litter
  - Certain soaps and detergents
  - Animal waste
  - Compost, peat and manure

Pesticides/Herbicides

- Types
  - Dust
  - Spray
  - Granular
  - Fumigants
  - Surface Coatings

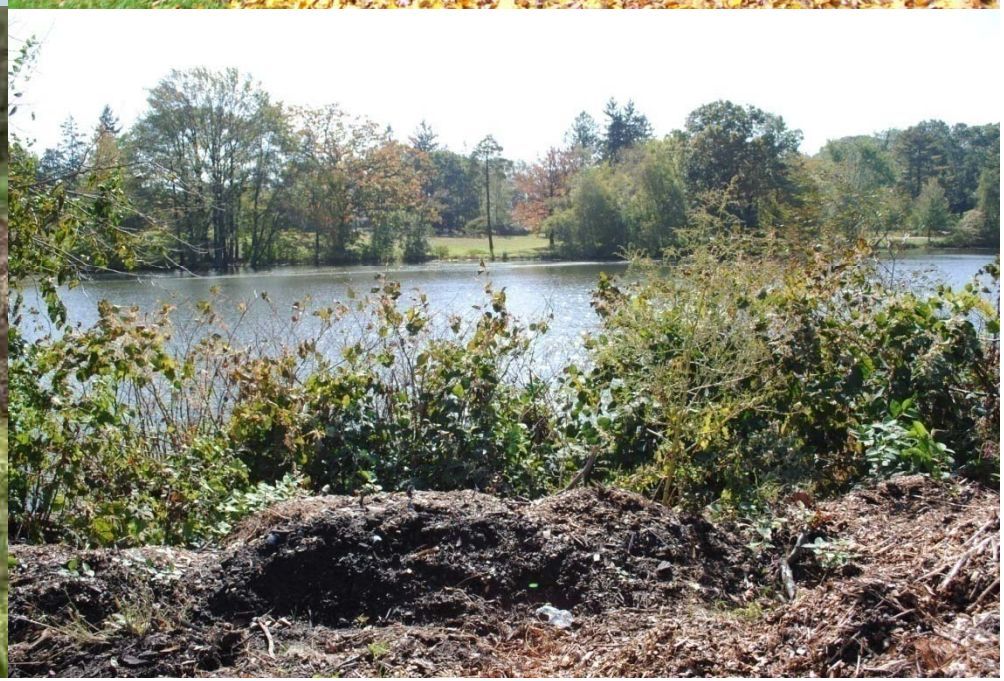
- Can enter into the storm drain system and waterways through the following methods:
  - Illegal dumping
  - Run-off from excessive irrigation
  - Heavy rains

Nuisance Animals and Pet Waste

- Waterfowl / Canada Geese
- Dogs
- Others

Organic Waste

- Leaf Litter
- Grass Clipping
- Compost



Sediment

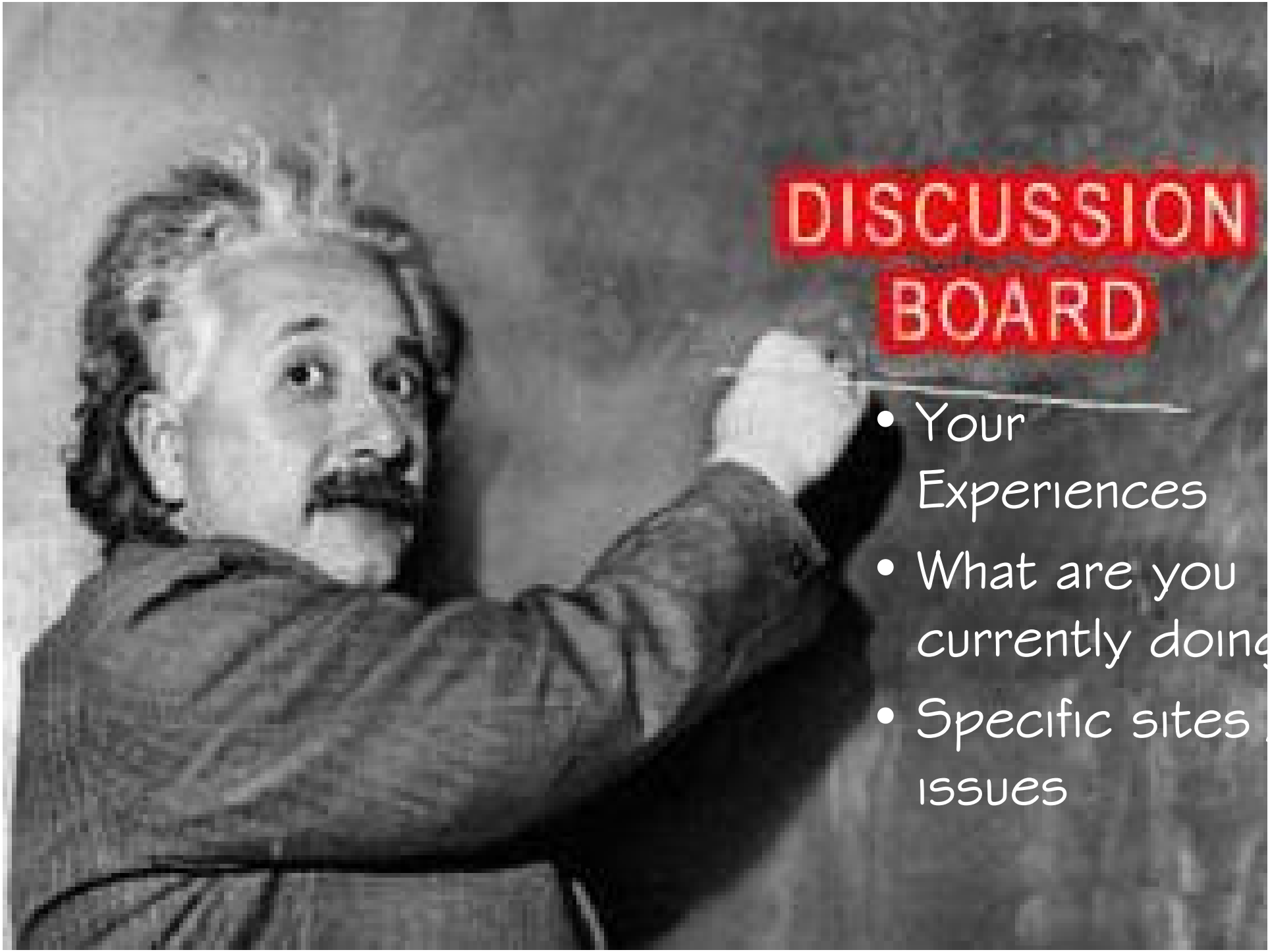
- EPA lists sediment as the most common pollutant in rivers, streams, lakes and reservoirs
- The most concentrated sediment releases come from construction activities
- Nutrients and other pollutants can be transported by sediment

Trash

- Poses a threat to wildlife and human health
  - choking hazards to wildlife
  - bacteria to humans
- Clogs storm drains
- Detracts from the aesthetics of a landscape

Deicing

- Salt
  - Can deplete the oxygen supply needed by aquatic animals and plants
  - Leach into the ground and change the soil composition
  - Leach into the groundwater
  - Deteriorate paved surfaces and infrastructure
- Sand
  - Enter catch basins, storm drains, and surface waters if it is not swept up each spring
  - Contribute to plugged storm drains, which can cause flooding
  - Fill in aquatic habitats, and cloud waterbodies


DISCUSSION
BOARD
• Your Experiences
• What are you currently doing
• Specific sites / issues

Overview of applicable regulations

- Introduction
- Water quality (25 min)
- Discussion: Experiences from participants (15 min)
- **Overview of applicable regulations (30 min)**
- Description of Best Practices (45 min)
- Q & A (10 min)
- Discussion: Regional Efficiencies (15 min)
- Concluding remarks – Wrap up (5 min)

Applicable Regulations

- MS4 permit requirements
  - Pollution prevention/good housekeeping
  - Other relevant requirements
- State
  - 303(d) lists
  - pesticide and fertilizer regulations
- Local regulations
  - Parks
  - Stormwater
  - Aquifer Protection

Overview of applicable regulations

- 2003 MS4 Minimum Requirements
  - Permittee Must Develop, Implement, and Enforce a Program to Reduce the Discharge of Pollutants from the MS4 to the extent practicable; protect water quality, and satisfy the water quality requirements of the Clean Water Act and Massachusetts Water Quality Standards
  - Permittee Must Develop and Implement a Storm Water Management Program prior to May 1, 2008

MS4 Stormwater Management Program Minimal Control Measures

1. Public Education and Outreach
2. Public Involvement and Participation
3. Illicit Discharge Detection and Elimination
4. Construction Runoff
5. Post-Construction Stormwater Management
6. **Pollution Prevention and Good Housekeeping in Municipal Operations**

Source: http://www.epa.gov/region1/npdes/stormwater/MS4_MA.html

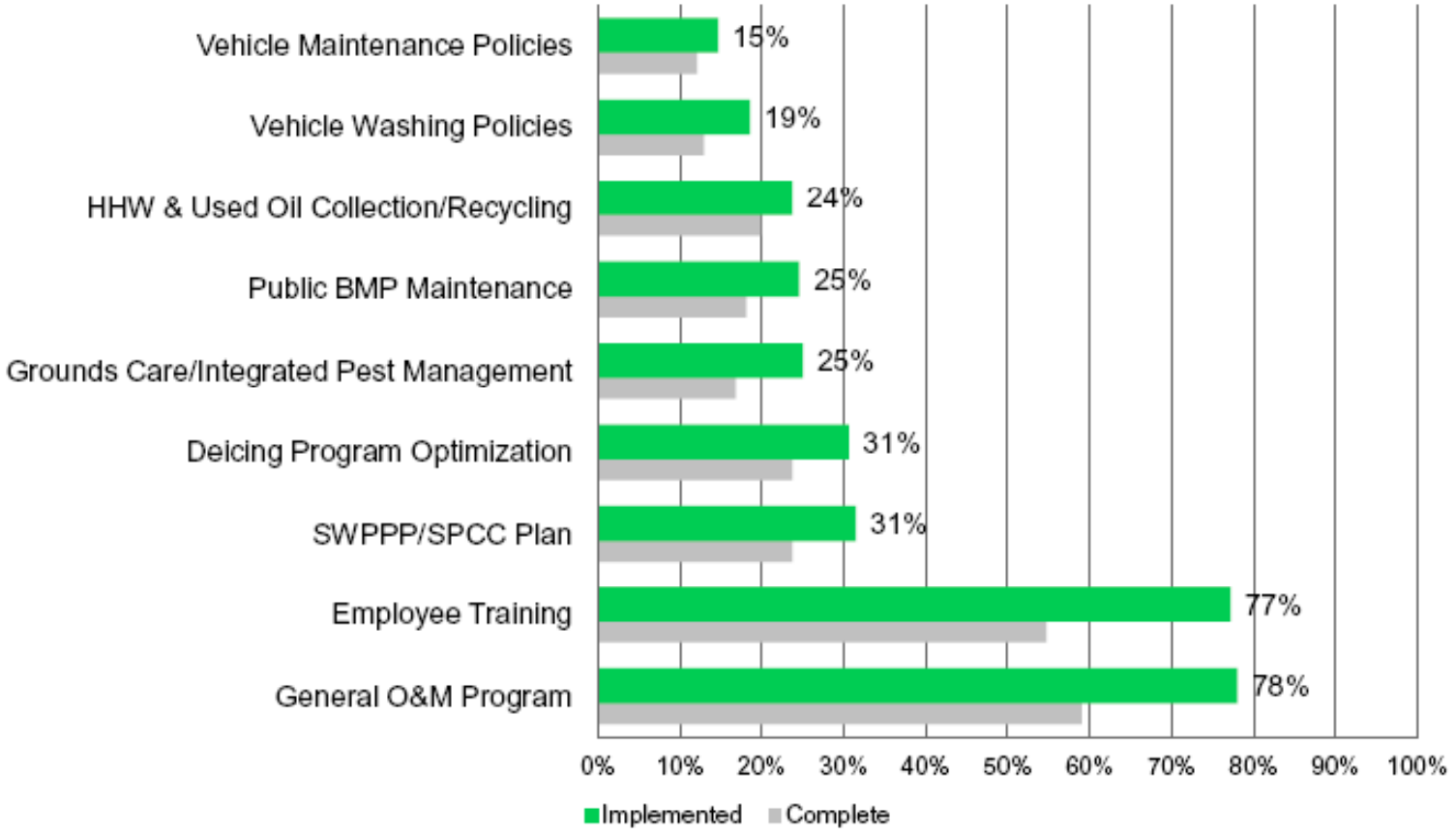
MS4 Permit Requirements For Pollution Prevention / Good Housekeeping in Municipal Operations

2003 Permit

- *Permittee must develop and implement a program with the goal of preventing and/or reducing pollutant runoff from municipal operations…and include, at a minimum, maintenance activities for: parks and open space, fleet maintenance, building maintenance….*
- *Develop schedules for municipal maintenance activities listed above*
- *Develop inspection procedures and schedules for long term structural controls*

EPA 2011-2012 Annual Report Summary (232 of 238 MS4s)

Pollution Prevention and Good Housekeeping BMPs (MCM6)



Percent reporting the use and completion of practice among the 97% of MA municipalities reporting

MS4 Permit Requirements 2.3.7 for Pollution Prevention / Good Housekeeping Control Measures

2014 Draft

- Develop Inventory of all Facilities by End of First Permit Year (annual updates)
- Written O&M Plans:
  - **Parks and Open Space**
  - Buildings and Facilities(Workshop 2)
  - Vehicle and Equipment Maintenance (Workshop 2)
  - Stormwater Infrastructure (Workshop 3)
- Specific Minimum Activities and Schedules
- Develop SWPPPs for facilities (Workshop 2)
- Additional Requirements for TMDL or Impaired Waters

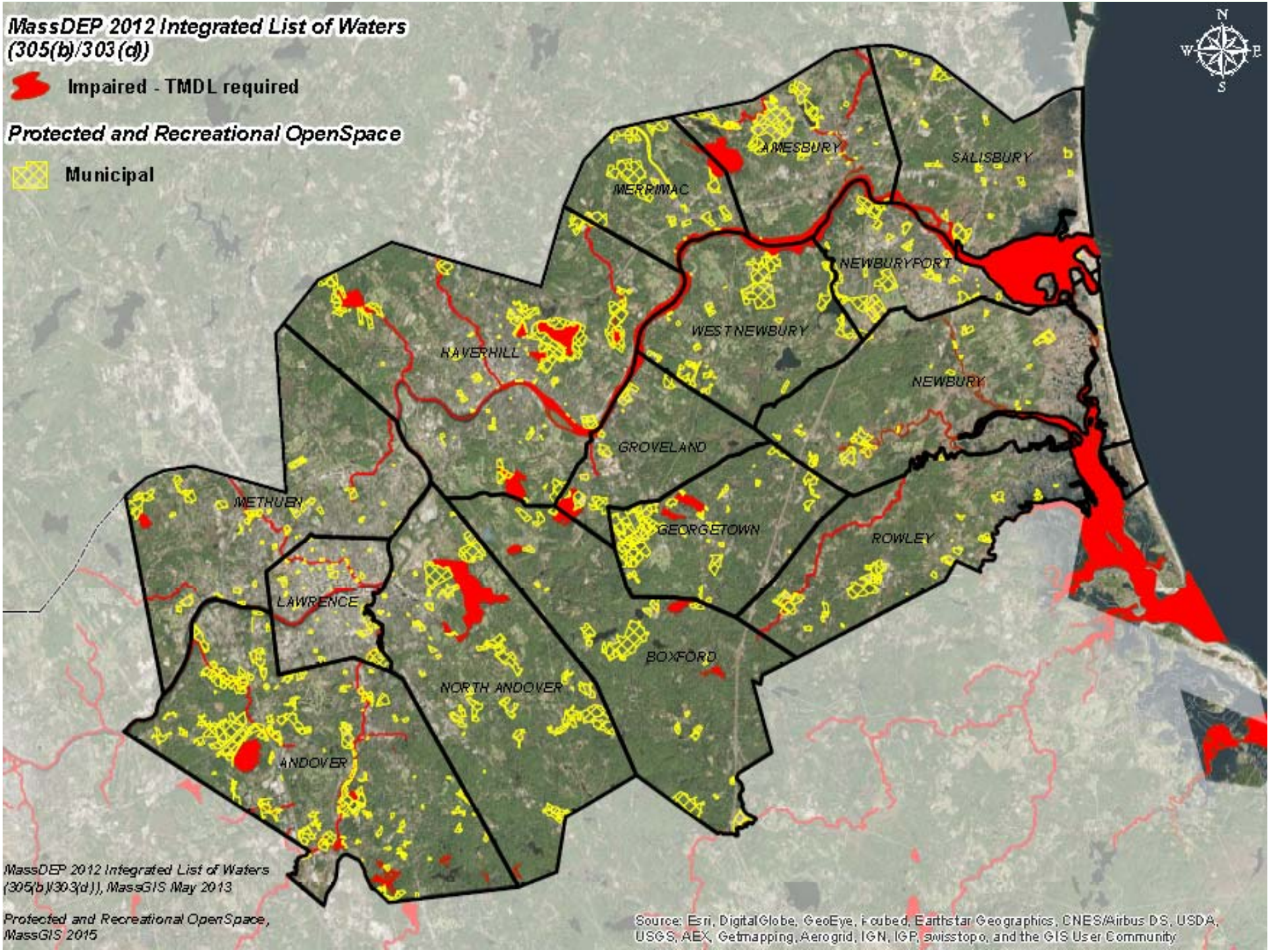
2014 Draft Permit: Parks and Open Spaces (2.3.7a(ii)(a))

- Establish procedures to address the proper use, storage, and disposal of pesticides, herbicides, and fertilizers:
  - ✓ minimizing the use of these products
  - ✓ ensuring their use is in accordance with manufacturers instructions
- Evaluate lawn maintenance and landscaping activities to ensure practices are protective of water quality:
  - ✓ Reduced lawn mowing frequencies
  - ✓ Proper disposal of lawn clippings
  - ✓ Use of alternative landscaping materials (i.e., natives and drought resistant species)
- Establish pet waste handling collection and disposal locations at all parks and open space including signage to promote these practices
- Establish procedures for management of trash containers at parks and open space, including:
  - ✓ scheduled cleanings
  - ✓ sufficient number of receptacles.

Location Matters

Requirements may differ depending on where the site is located and how the permittee defines the regulated area:

- In the MS4 regulated area
- Town wide / jurisdiction
- In a TMDL watershed
- In a non-TMDL, but water quality limited watershed – 303(d)
- Public Drinking Water Supply Resource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WQ Parameter	Additional Good Housekeeping Requirements for non-TMDL Impaired Waters (Appendix H)
I. Nitrogen	1. Establish requirements for: • use of slow release fertilizers • manage grass clippings and leaf litter, including prohibiting blowing of organic waste onto impervious cover • Increased street-sweeping to 2x/yr (spring and fall) 2. Develop Nitrogen Source Identification Report 3. Structural retrofit (demo) implemented YR 5
II. Phosphorus	1. Establish requirements for: • manage grass clippings and leaf litter, including prohibiting blowing of organic waste onto impervious cover • Increased street-sweeping to 2x/yr (spring and fall) 2. Develop Phosphorous Source Identification Report 3. Structural retrofit (demo) implemented YR 5
III. Bacteria	No additional (enhanced education and IDDE)
IV. Chloride	1. Salt Reduction Plan (5YR to fully implement) 2. Track salt type and amount used 3. Operational changes, equipment changes, training, guidelines for application rate 4. Address privately-owned facilities
V. Solids/ Oils/ Metals	• Increased street sweeping and optimization of commercial/industrial/high pollutant load areas

Additional requirements under approved TMDLs (Appendix F)

In State TMDL	Good housekeeping requirements
I. Charles River Watershed Phosphorus TMDL And II. Lake & Pond Phosphorus TMDL	1. Phosphorus Control Plan with description of nonstructural measures; 2. Calculate Phosphorus reductions due to four reduction factors: • Enhanced street sweeping • Catch basin cleaning • No application of fertilizers containing phosphorus • Organic waste and leaf litter collection program 3) Full implementation of non-structural/structural controls-Permit YR 6/8
III. Bacteria and Pathogen TMDLs	No additional requirements (enhanced education and IDDE)
IV. Cape Cod Nitrogen TMDL	Establish requirements for: • use of slow release fertilizers • manage grass clippings and leaf litter, including prohibiting blowing of organic waste onto impervious cover • Increased street-sweeping to 2x/yr (spring and fall)
V. Assabet River Phosphorus TMDL	Establish requirements for: • manage grass clippings and leaf litter, including prohibiting blowing of organic waste onto impervious cover • Increased street-sweeping to 2x/yr (spring and fall)

Additional requirements under approved TMDLs (Appendix F)

B. Out-of-State TMDL	Good housekeeping requirements
I. Long Island Sound Nitrogen TMDL*	1. Establish requirements for: • use of slow release fertilizers • manage grass clippings and leaf litter, including prohibiting blowing of organic waste onto impervious cover • Increased street-sweeping to 2x/yr (spring and fall) 2. Develop Nitrogen Source Identification Report 3. Structural retrofit (demo) implemented YR 5
II. Rhode Island Phosphorus TMDLs	1. Establish requirements for: • manage grass clippings and leaf litter, including prohibiting blowing of organic waste onto impervious cover • Increased street-sweeping to 2x/yr (spring and fall) 2. Develop Phosphorous Source Identification Report 3. Structural retrofit (demo) implemented YR 5
III. Rhode Island bacteria TMDLs	No additional requirements (enhanced education and IDDE)
IV. Rhode Island metals TMDLs	• Increased street-sweeping of municipal roads and parking lots where high pollutant potential • Structural BMPs to include containment/shutdown mechanism

2014 Draft Permit: Other Good Housekeeping Requirements

Buildings and Facilities

- Use, storage, and disposal of petroleum products and other potential stormwater pollutants
- Employee training in proper procedures
- Spill Prevention Plans, if applicable
- Procedures for dumpsters and other waste management equipment
- Parking lot and facility housekeeping measures

Vehicles and Equipment

- Procedures for vehicle storage
- Fueling areas
- Vehicle washing procedures to eliminate discharge of wash waters to storm drain or surface waters

2014 Draft Permit: Other Good Housekeeping Requirements

Infrastructure Operations and Maintenance

- Catch basin cleaning and prioritization
- Street and parking lot sweeping
- Winter road maintenance
- BMP and drainage system inspection and maintenance.

Stormwater Pollution Prevention Plans (SWPPP)

- For separate maintenance garages , public works yards, transfer station, etc.
- Team, facility description and pollution sources
- Stormwater controls

Other related MS4 Stormwater Management Program Elements

1. Public Education and Outreach
   - Lawn care and pet waste messaging
2. Public Involvement and Participation
   - Demonstrations at parks and schools? Trash pick ups, tree planting, etc.
3. Illicit Discharge Detection and Elimination
   - Check connections at facilities
4. Construction Runoff
5. Post-Construction Stormwater Management
   - Inventory of retrofit opportunities
   - Demonstrations
6. Pollution Prevention and Good Housekeeping in Municipal Operations

Local Regulations on Park Use

- Town Regulations for Parks
- Consistency with MS4 Goals
- Adopt and Revise local regulations
- Resource Areas
  - Wetlands and Areas of Critical Concern
  - Drinking Water sources / Zone I and Zone II


City of Haver
Winnikenni Par
Conservation Ar
Legend
Beach
Boat Ramp
Bridge
Dam
Entry
Historic Site
Parking
Picnic Area
Recreational A
Restroom
Scenic View
Stone Wall
Stream
Difficulty
Easy to Moderate
Permitted Uses
Current as
Locus
Haverhill
Amesbury Rd
Shattuck St
Sunrise St
Elliott St
Kenoza St
Edgehill Rd
Cliffwood St
Newton Rd
Longview St
Midlake St
Castle Rd
Lakeside St
Eastland Terrace
Westland Terrace
Kenoza Lake
Lake Saltonstall
Barberry Lane
Arlington Terrace
Arlington St
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Other Pesticides and Fertilizer Regulations

- Federal Insecticide, Fungicide, Rodenticide Act (FIFRA) regulates use, storage, and disposal of containers and waste
- Massachusetts Pesticide Control Act (MPCA) since 1978 under Department of Agricultural Resources (MGL Chapter 132B)
  - Pesticide Program – Part of the Division of Crop and Pest Services
  - All Pesticide applicators are required to be licensed (Commercial Applicator License)
  - Approves pesticides for use in Massachusetts
- Fertilizer Regulations (330 CMR 31) - Pending

Good Housekeeping/Pollution Prevention

- Introduction
- Water quality at public parks and recreation areas (25 min)
- Discussion: Experiences from participants (15 min)
- Overview of applicable regulations (30 min)
- **Description of Best Practices (45 min)**
- Q & A (10 min)
- Discussion: Regional Efficiencies (15 min)
- Concluding remarks – Wrap up (5 min)

What is Municipal Pollution Prevention/ Good Housekeeping?

Our working definition:

- Assessment and subsequent alteration of municipal operations to reduce the amount of pollution entering the storm drain system and, eventually, receiving water **through the implementation of Best Management Practices (BMPs)**

Benefits

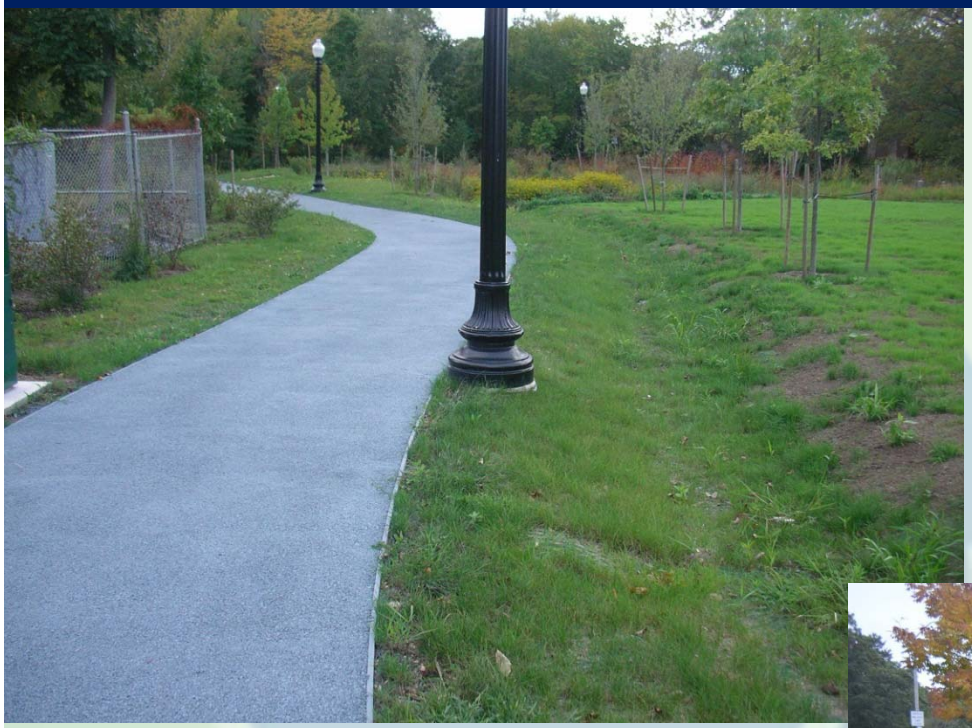
- Can help satisfy other minimum control measures
  1. **Public Education and Outreach**
  2. **Public Participation/Involvement**
  3. **Illicit Discharge Detection and Elimination**
  4. **Construction Site Runoff Control**
  5. Post Construction Runoff Control
  6. Pollution Prevention/Good Housekeeping
- Helps reduce liability and future maintenance/clean up burden
- Minimizes environmental and health risks to staff and residents
- Cost savings

Surface Runoff

Disconnect

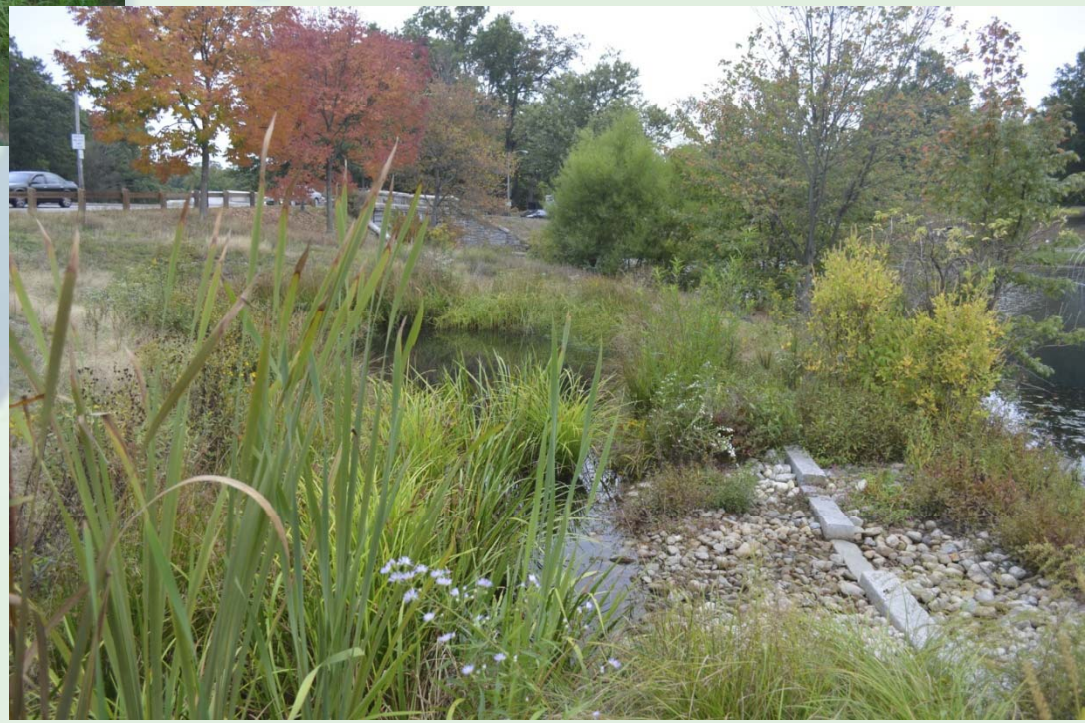
Reduce

Surface Runoff



Intercept

Treat




STOP

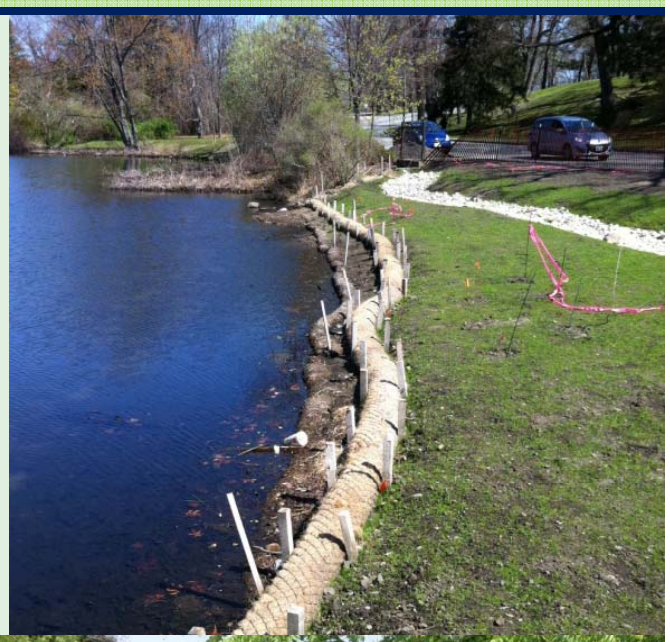

Bike Route

Mill River Park – Taunton, MA

Mill River Park – Taunton, MA

Sediment and Erosion Control

- Don’t mow within 10 to 25 feet from the edge of a stream or creek
- Stabilize bare spots in the landscape
- Use erosion control BMPs during construction project
- Sweep sidewalks and driveways instead of using a hose and water



Nutrients

- Fertilizer applications
  - Perform soil test to determine actual needs
    - https://soiltest.umass.edu/
  - Calibrate spreaders to avoid over application
  - Coordinate applications with weather
  - Recommended application setbacks
    - 5’ from pavement
    - 25’ from storm drains
    - 50’ from water bodies

Nitrogen

- Water Soluble (WSN)
- **Slow Release (SRN)**
  - Water insoluble (WIN)
  - Controlled Release (CRN)
- Natural/Organic
  - When using natural organic be careful not to over apply P
- Organic sources
  - Compost (manure)
  - Corn gluten
  - Recycled mulch grass clippings

Source: BEST MANAGEMENT PRACTICES FOR LAWN AND LANDSCAPE TURF version 1.5 Prepared by: Mary C. Owen, Umass Extension Turf Specialist , Jason D. Lanier, Extension Educator

Phosphorus

- Apply based on soil results
- For mature turf, phosphorus application is rarely needed on most soils
- **Limit input to the lowest possible level needed to achieve adequate turf**
- Natural Organic sources of P do not pose a lower risk to water resources than synthetic P.
  - When using natural organic be careful not to over apply P
- Organic sources
  - Compost (manure)
  - Corn gluten
  - Recycled mulch grass clippings
- TMDLs - No application of fertilizers containing P

Source: BEST MANAGEMENT PRACTICES FOR LAWN AND LANDSCAPE TURF version 1.5 Prepared by: Mary C. Owen, Umass Extension Turf Specialist , Jason D. Lanier, Extension Educator

Turf Reduction

- Consider turf replacement with native trees/shrub plantings
- Consider turf alternatives
  - Native seed mixes
  - Low mow
- Allow natural regeneration in suitable areas

Source: Urban Watershed Restoration Manual Series: Municipal Pollution Prevention/Good Housekeeping Practices

Turf Maintenance

- Avoid blowing/depositing grass clipping on paved surfaces
- Use mulching type mowers
  - Provides natural fertilizer
- Dispose of grass clippings at local compost facility
- Change mowing frequency/raise mowing height for non-active recreational areas
- Stabilize bare soil
- Do not stockpile materials near storm drains or water bodies

Source: Urban Watershed Restoration Manual Series: Municipal Pollution Prevention/Good Housekeeping Practices

Mowing

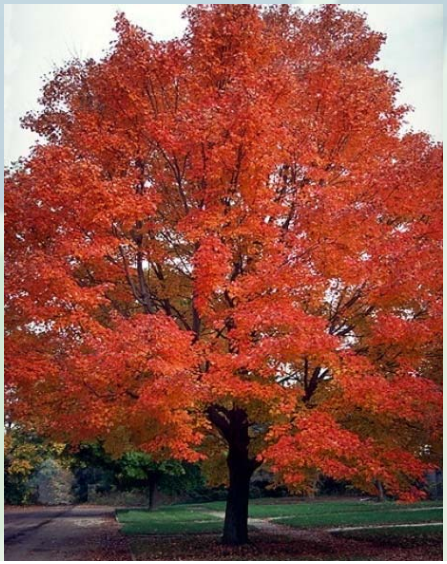
Mowing

Organic Waste

- Collect landscape waste and dispose of at composting facility
- Do not blow leaves grass clipping and other landscape debris into:
  - Streets
  - Water bodies
  - Storm drains, and other stormwater practices
- Collection Program

Native Planting

- Use native species
- Plant in group massings
  - Set up a system to create healthy plant communities and habitat
- Drought tolerant



Watering and Irrigation

- Use rain sensors to prevent irrigation after rain events
- Irrigate specific to each landscaped area planting needs
- Select native drought tolerant plant species or cultivars
- Use tree gators, soaker hoses for plant watering
  - Establishment only
- Do not water lawns/ turf daily
  - Less frequent, longer watering
  - Water in the mornings or evenings
- Avoid watering pavement

Source: Urban Watershed Restoration Manual Series: Municipal Pollution Prevention/Good Housekeeping Practices

Nuisance Animals

PROVIDENCE Journal

Home | Breaking News | Topics | Politics | Sports | Business | Opinion | A&E | Marketplace

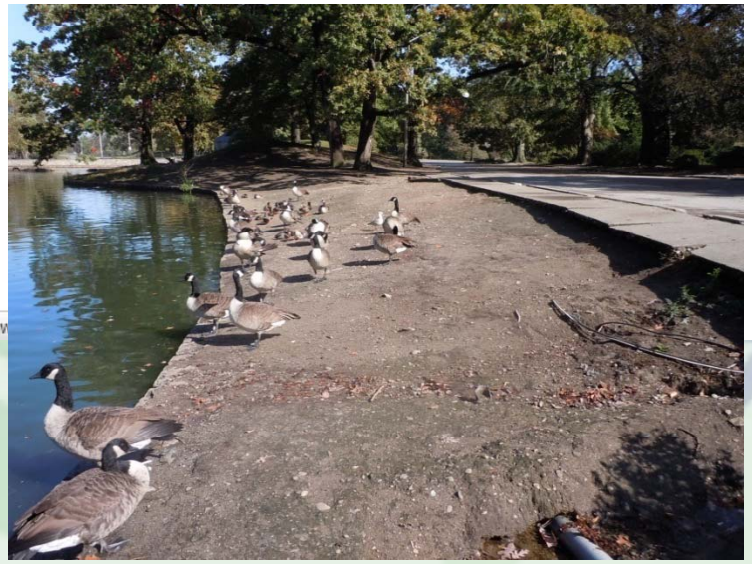
BREAKING NEWS

Providence park has 410 geese killed to protect pond birds' wastes

Comments 273 | Recommend 0

July 23, 2012 7:37 am

By Tatiana Pina



Geese Harvesting: Last Resort at Roger Williams Park

By TIM FAULKNER/ecoRI News staff

PROVIDENCE — Getting rid of geese isn't easy. Egg oiling, dogs and coyote decoys all are have their drawbacks. Last month, Roger Williams Park opted for more drastic action — capturing and killing 410 of its some 1,000 resident Canada geese.

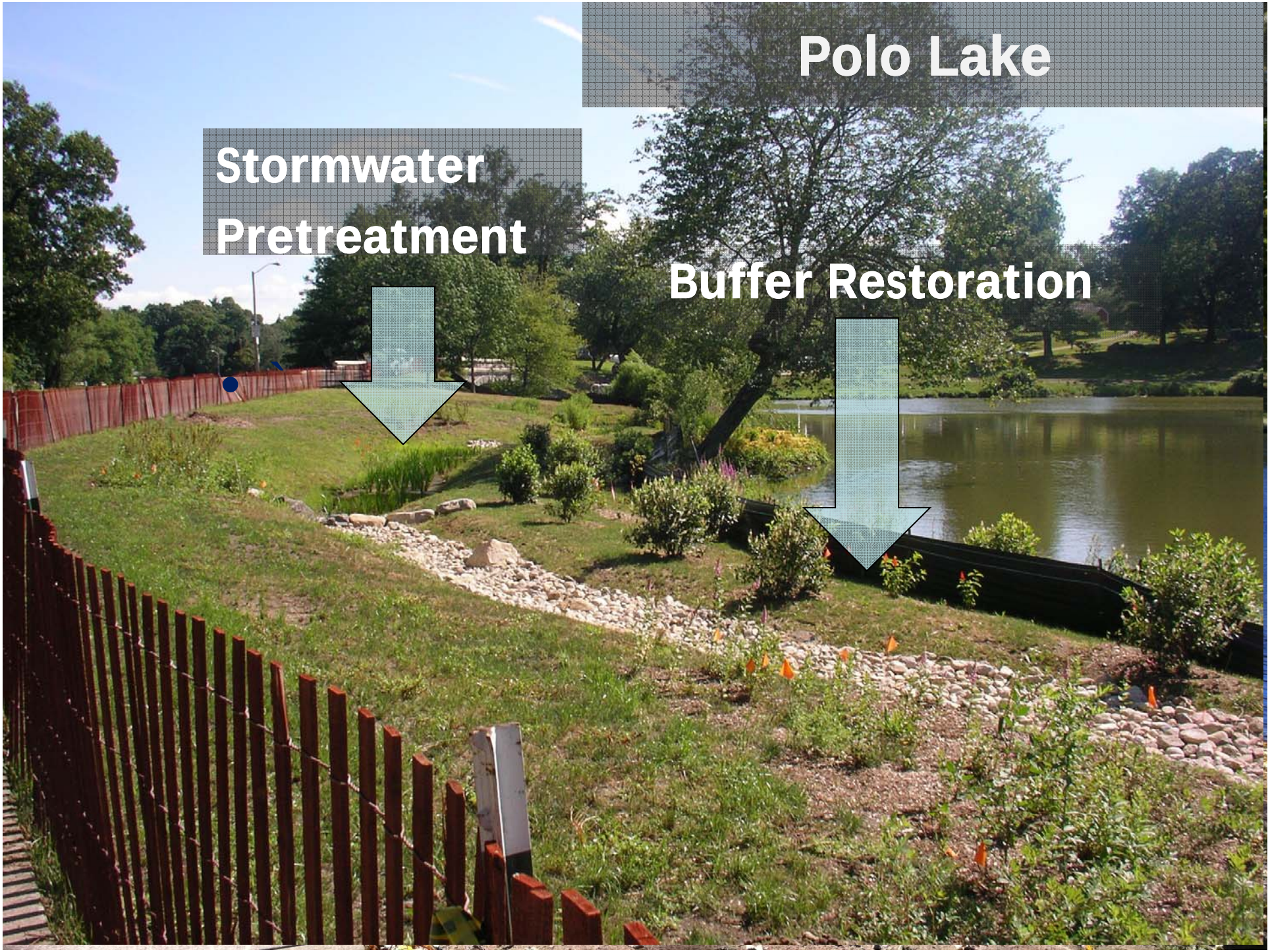
The controversial tactic was heightened by the fact the goose meat was processed for eventual delivery to area soup kitchens.

According to the U.S. Department of Agriculture (USDA) Wildlife Services, which carried out the project, the capture occurred in mid-July when the geese were molting and less apt to fly. They were herded into fenced-in areas and placed in turkey crates. They were later euthanized with carbon dioxide, a method approved by the American Veterinarian Medical Association.

Nutrients found in geese waste acts as fertilizer that causes algae to grow uncontrollably.

The meat was then donated to a local "hunters for the hungry" wildlife meat program and distributed to soup kitchens in Massachusetts.


Stormwater Pretreatment
Pavement Reduction
Buffer Restoration


Polo Lake
Stormwater Pretreatment
Buffer Restoration

Herbicide & Pesticide

- Monitor plants for damage and invasives
- Pesticides/Herbicides should be avoided
- Adopt an **I**ntegrated **P**est **M**anagement (IPM) approach
  - ***Cultural***
  - ***Biological***
  - ***Physical/Mechanical***
  - ***Chemical controls***

Cultural Control

- Set up a system - avoid just planting objects
  - Right Plant / Right Place
  - Plant Natives
  - Create Habitats
  - Avoid the use of pest prone plants
  - Use resistant species and when applicable cultivars
  - Avoid monoculture
  - Proper watering
  - Induce competition to prevent invasives
  - Proper pruning / spacing
  - Remove diseased plants

Biological Control

- Use of living organisms
  - Conservation
  - Augmentation
  - Introduction
- Conservation
  - Protect naturally occurring beneficial organisms
  - Creation of healthy habitats
- Augmentation
  - Add to the existing organisms
- Introduction
  - Introducing new organisms

Mechanical Control

- Insect control
  - Washing aphids off leaves
  - Pruning out caterpillars
  - Create barriers
- Weeds/Invasives
  - Effective early in the season
  - Hand pulling / mowing
  - Weed supression

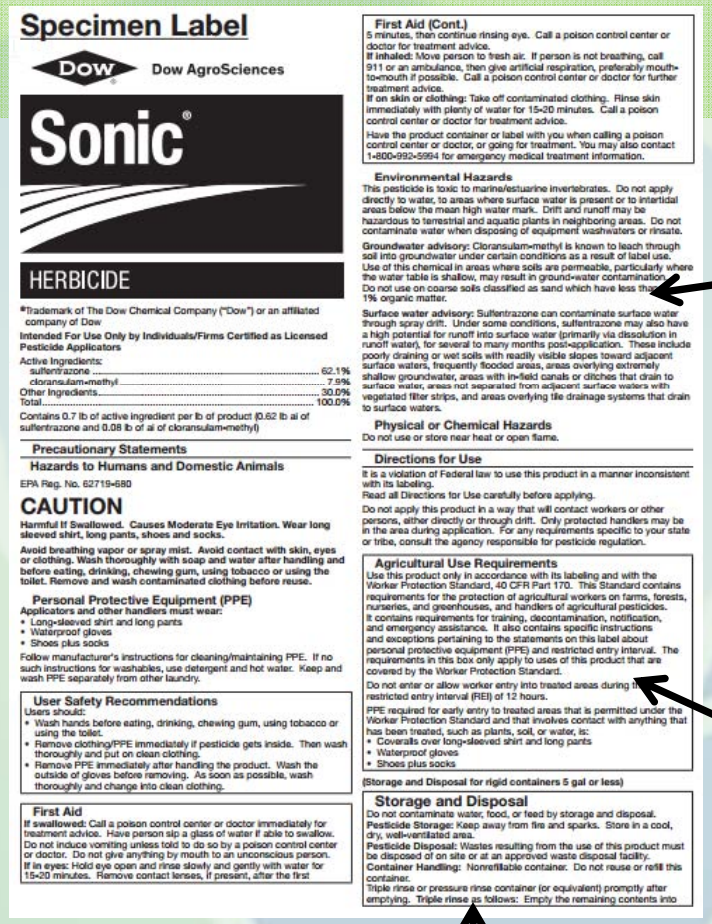
Chemical Control

- Consider other options first
  - Botanically derived options
- Assess window of opportunity / time of application
- Consult a professional

Pesticide & Herbicide Storage

- Address Application and Storage in O&M Procedures
- Product application in accordance with product label and use information
- Store products separate from each other and other chemicals in dry conditions, in the original containers
- Use pallets to keep large drums or bags off the floor

Source: UMASS Extension Program



Specimen Label

Dow AgroSciences

Sonic®

HERBICIDE

*Trademark of The Dow Chemical Company ("Dow") or an affiliated company of Dow

Intended For Use Only by Individuals/Firms Certified as Licensed Pesticide Applicators

Active Ingredients:

sulfentrazone	62.1%
cloransulam-methyl	7.9%
Other Ingredients	30.0%
Total	100.0%

Contains 0.7 lb of active ingredient per lb of product (0.62 lb ai of sulfentrazone and 0.08 lb of ai of cloransulam-methyl)

Precautionary Statements

Hazards to Humans and Domestic Animals

EPA Reg. No. 62719-680

CAUTION

Harmful If Swallowed. Causes Moderate Eye Irritation. Wear long sleeved shirt, long pants, shoes and socks.

Avoid breathing vapor or spray mist. Avoid contact with skin, eyes or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Remove and wash contaminated clothing before reuse.

Personal Protective Equipment (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Waterproof gloves
- Shoes plus socks

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

User Safety Recommendations

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling the product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

First Aid

If swallowed: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person. **If in eyes:** Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first

First Aid (Cont.)

5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.
If inhaled: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a poison control center or doctor for further treatment advice.
If on skin or clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-992-5994 for emergency medical treatment information.

Environmental Hazards

This pesticide is toxic to marine/estuarine invertebrates. Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Drift and runoff may be hazardous to terrestrial and aquatic plants in neighboring areas. Do not contaminate water when disposing of equipment washwaters or rinsate.

Groundwater advisory: Cloransulam-methyl is known to leach through soil into groundwater under certain conditions as a result of label use. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in ground-water contamination. Do not use on coarse soils classified as sand which have less than 1% organic matter.

Surface water advisory: Sulfentrazone can contaminate surface water through spray drift. Under some conditions, sulfentrazone may also have a high potential for runoff into surface water (primarily via dissolution in runoff water), for several to many months post-application. These include poorly draining or wet soils with readily visible slopes toward adjacent surface waters, frequently flooded areas, areas overlying extremely shallow groundwater, areas with in-field canals or ditches that drain to surface water, areas not separated from adjacent surface waters with vegetated filter strips, and areas overlying tile drainage systems that drain to surface waters.

Physical or Chemical Hazards

Do not use or store near heat or open flame.

Directions for Use

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.
Read all Directions for Use carefully before applying.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your state or tribe, consult the agency responsible for pesticide regulation.

Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls over long-sleeved shirt and long pants
- Waterproof gloves
- Shoes plus socks

(Storage and Disposal for rigid containers 5 gal or less)

Storage and Disposal

Do not contaminate water, food, or feed by storage and disposal.
Pesticide Storage: Keep away from fire and sparks. Store in a cool, dry, well-ventilated area.
Pesticide Disposal: Wastes resulting from the use of this product must be disposed of on site or at an approved waste disposal facility.
Container Handling: Nonrefillable container. Do not reuse or refill this container.
Triple rinse or pressure rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into

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This pesticide is toxic to marine/estuarine invertebrates. Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Drift and runoff may be hazardous to terrestrial and aquatic plants in neighboring areas. Do not contaminate water when disposing of equipment washwaters or rinsate.

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Pesticide & Herbicide Storage

- Bulk storage tanks should feature secondary containment sized to contain 110% of the storage tank.
- Storage area should be locked and signage provided to warn emergency responders
- Oxidizers and flammables should be stored separately
- Implement Inventory Control to minimize waste

Source: UMASS Extension Program

Pet Waste

- Signage / Pet waste stations
- Dog Parks within Recreation Areas
- Dog Restrictions

Trash Management

- Address Trash Management in O&M Procedures
  - Establish scheduled cleanings of trash containers at parks and open space
  - Provide sufficient numbers of containers
  - Ensure container lids and dumpster covers are in place and functional (discourage animal foraging and shed precipitation)

Waste Collection Considerations

- Important for bacteria and trash reduction goals
- Does this make sense for all parks/recreation areas?
  - » What if dogs are not allowed , still provide stations and signage?
  - » Site is remote / difficult for vehicle access?
  - » Pack in Pack Out Approach?
- What are common siting, equipment type, installation, and routine maintenance issues?

Deicing Application and Storage

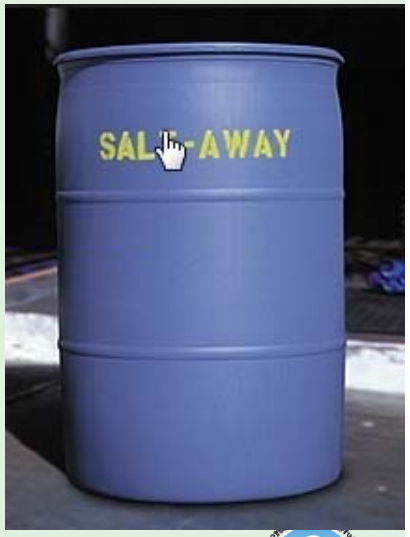
Pollution Prevention and Good Housekeeping Metric

De-Icing Products Used

Product	Reported using product
NaCl	102 municipalities
$CaCl_2$	43 municipalities
$MgCl_2$	15 municipalities
Sand	107 municipalities

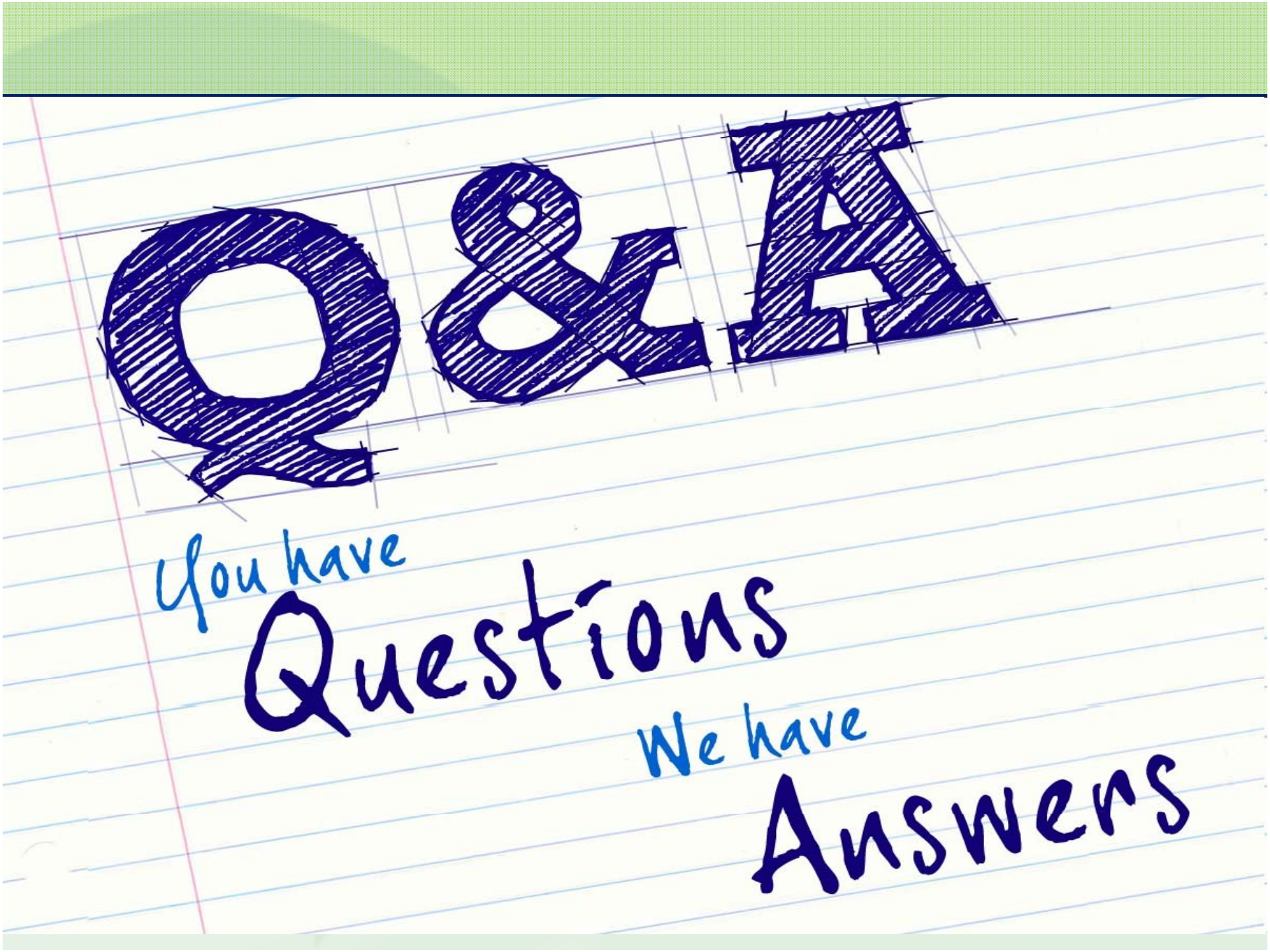
Deicing Application and Storage

- Address Salt Storage and Use in O&M Procedures
  - Identify storage areas
  - Assign responsibility for storage area management
- Prevent exposure of storage areas to precipitation by enclosing or covering the storage pile
- Reduce salt application in chloride sensitive areas



Good Housekeeping/Pollution Prevention

- Introduction
- Water quality at public parks and recreation areas (25 min)
- Discussion: Experiences from participants (15 min)
- Overview of applicable regulations (30 min)
- Description of Best Practices (45 min)
- **Q & A (10 min)**
- **Discussion: Regional Efficiencies (15 min)**
- **Concluding remarks – Wrap up (5 min)**


Q&A
You have
Questions
We have
Answers

Discussion: Regional Efficiencies

- Do you have any programs in place?
- Thoughts on potential opportunities
  - ✓ Regional public/education outreach
  - ✓ Pet waste messaging
  - ✓ Uniformity between town requirements
  - ✓ Sharing of equipment – porous pavement vacuum truck
  - ✓ Pesticide/Invasive Management
  - ✓ Sharing of information/plans
- Inter departmental efficiencies
- Conservancies/Watershed organizations

Resources

- CWP Urban Watershed Restoration Manual Series:

  Municipal Pollution Prevention/Good Housekeeping Practices
- UMASS Extension Program - Best Management Practices for Lawn and Landscape Turf - Mary C. Owen, UMASS Extension Turf Specialist
- Central Massachusetts Regional Stormwater Coalition
- MassDEP 2012 Integrated List of Waters 303(d)
- http://www.epa.gov/region1/npdes/stormwater/MS4_MA.html
- Integrated Pest Management Manual (US Department of the Interior National Park Service, 2003) http://www.nature.nps.gov/biology/ipm/manual/ipmmanual.cfm

Resources

- Cooperative Research Center for Integrated Pest Management Website (National Science Foundation, 2007) http://cipm.ncsu.edu/
- California Stormwater Best Management Practice Fact Sheet SC-73: Landscape Maintenance (California Stormwater Quality Association, 2003) http://www.cabmphandbooks.org/Documents/Municipal/SC-73.pdf
- Best Management Practice Fact Sheet: Landscape and Grounds Maintenance (Alameda County (CA) Clean Water Program, 1998) http://www.cleanwaterprogram.org/bddmaint_fact_sht.pdf
- Merrimack Valley Planning Commission

Closing Remarks

Workshop 1 – Parks & Recreation Areas
Tuesday, March 10, 2015 (8 - 11:00 AM)
Snow date: Thursday, March 12, 2015
Northern Essex Community College - Classroom

Workshop 2: Buildings, Facilities, Vehicle and Equipment Maintenance
Friday, March 20, 2015 (8 - 11:00 AM)
Andover Public Safety Building and Public Works Maintenance Yard

Workshop 3: Stormwater Management and Infrastructure Maintenance
Friday, April 10, 2015 (8 - 11:00 AM)
Northern Essex Community College – Classroom

THANK YOU

Brian Kuchar, P.E., RLA
bkuchar@horsleywitten.com
Gary Hedman
ghedman@horsleywitten.com

Horsley Witten Group, Inc.
Sandwich: 508-833-6600
Newburyport: 978-499-0601