

Tools to Help Meet CT's MS4 Requirements



COST Conference on
Environmental & Land Use Issues

October 23, 2018

Dave Dickson, UConn CLEAR

Center for Land Use Education & Research



Water (NEMO)



Land Use &
Climate Resiliency



Geospatial Tools &
Training



Conservation &
STEM Education

MISSION: *to provide information and assistance to land use decision makers and other audiences in support of better land use decisions, healthier natural resources, and more resilient communities.*

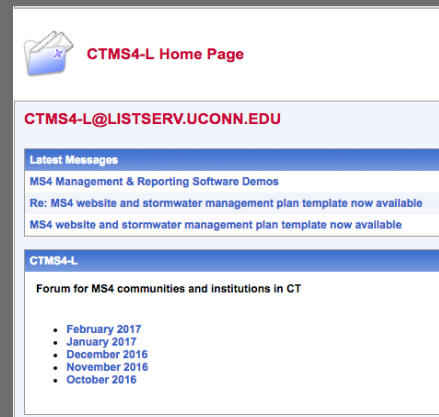
NEMO's MS4 Support

Funded by DEEP for 5 years

- MS4 educator
- website & listserv
- workshops & webinars
- maps & data



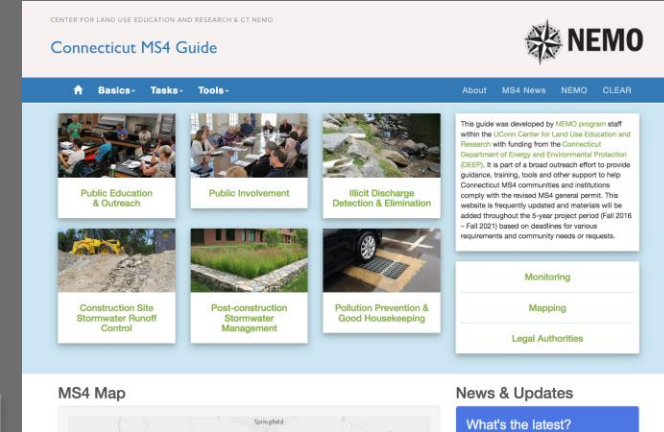
Amanda Ryan



<http://s.uconn.edu/ctms4list>



maps & data

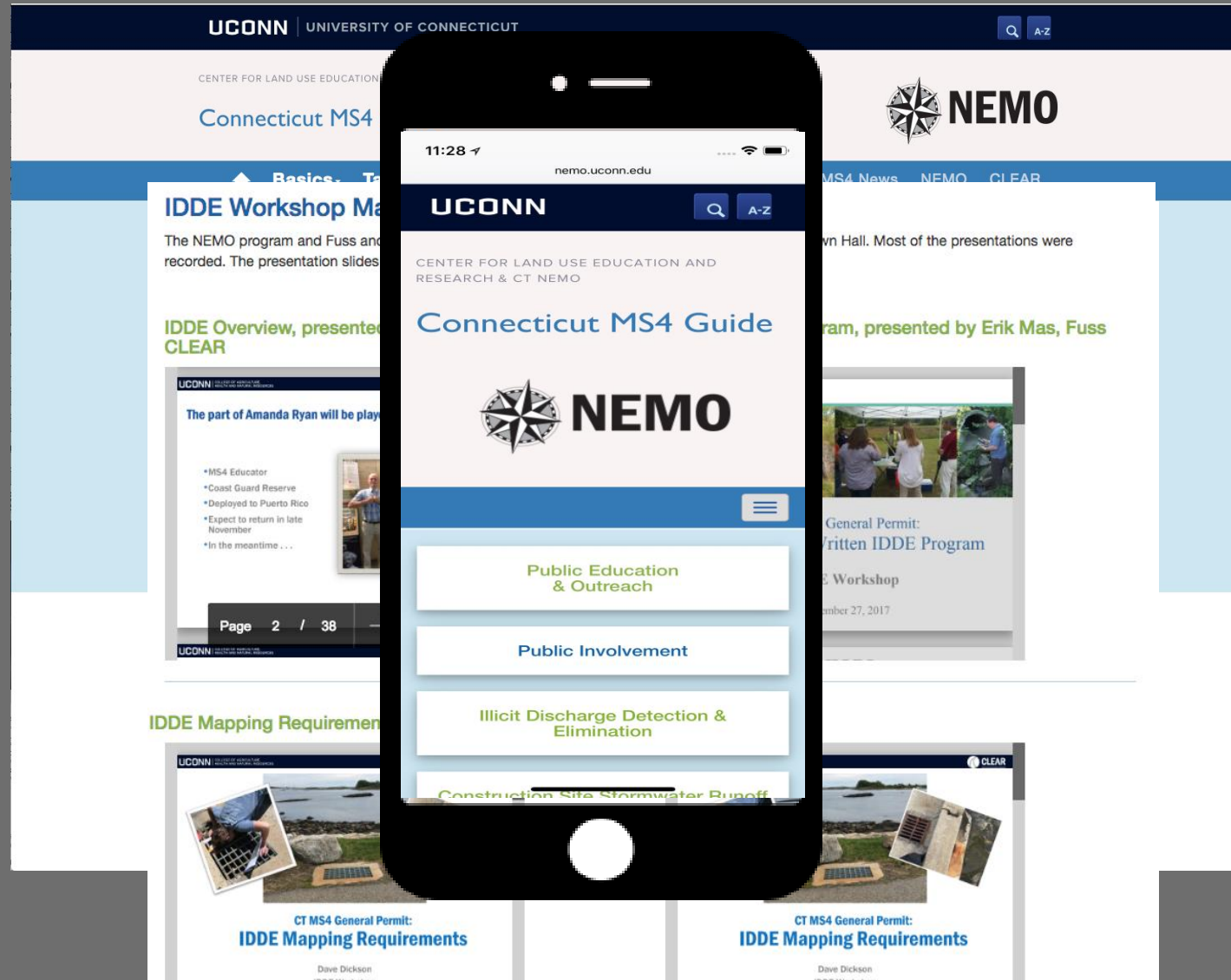


<http://nemo.uconn.edu/ms4>



workshops & webinars

Online MS4 Guide



MS4 Full Task List

MS4 Tasks for 2004 Permittees

Legend							Permit page	Implementation Deadline	Year 1	Year 2	Year 3	Year 4	Year 5
MCM 1	MCM 2	MCM 3	MCM 4	MCM 5	MCM 6	Monitoring			July 2017 - June 2018	July 2018 - June 2019	July 2019 - June 2020	July 2020 - June 2021	July 2021 - June 2022
Employee stormwater management training program							31	Jul 1 2017	✓	✓	✓	✓	✓
Update and implement public education and outreach program							19	Jul 1 2017	✓	✓	✓	✓	✓
Interdepartmental Coordination plan							26	Jul 1 2017	✓	✓	✓	✓	✓
Site plan review for stormwater practices							26	Jul 1 2017	✓	✓	✓	✓	✓
Site inspections for stormwater practices							26	Jul 1 2017	✓	✓	✓	✓	✓
Receive public input to development projects							26	Jul 1 2017	✓	✓	✓	✓	✓
Notify developers of DEEP construction general permit							26	Jul 1 2017	✓	✓	✓	✓	✓
Track DCIA (additions and subtractions)							30	Jul 1 2017	✓	✓	✓	✓	✓
Citizen reporting program							22	Jul 1 2017	✓	✓	✓	✓	✓
Record illicit discharge abatement activities							23	Jul 1 2017	✓	✓	✓	✓	✓
Maintain Inventory of known SSOs (5 year look back)							App B p2	Oct 30 2017	✓	✓	✓	✓	✓
Post draft Annual Report							21	Feb 15 annually	✓	✓	✓	✓	✓
Submit final Annual Report to DEEP							21	Apr 1 annually	✓	✓	✓	✓	✓
Sweep streets in Priority Areas at least 1x per year							35	none specified	✓	✓	✓	✓	✓
MS4 Property O&M							33	none specified	✓	✓	✓	✓	✓
Log catch basin inspections & cleanings (including volume of material removed)							37	none specified	✓	✓	✓	✓	✓
Develop/implement deicing material SOP							37	none specified	✓	✓	✓	✓	✓
Implement snow/ice SOP to minimize stormwater pollution							37	none specified	✓	✓	✓	✓	✓
Establish catch basin inspection and cleaning schedule							36	Jul 1 2018	✓				
Develop alternate plan for sweeping streets outside Priority Area (if not sweeping c 1x per year)							35	Jul 1 2018	✓				
Develop written ID DE program							22 & App B p4	Jul 1 2018	✓				
Establish IDDE legal authority							23 & App B p5	Jul 1 2018	✓				
Map all MS4 outfalls							23 & App B p2	Jul 1 2019		✓			
Update construction site legal authority							25	Jul 1 2019		✓			
Maintenance plan for SW ponds & treatment structures							30	Jul 1 2019		✓			
Determine baseline DCIA							30	Jul 1 2020			✓		
Develop retrofit plan							32	Jul 1 2020			✓		
Complete dry weather outfall sampling (for high & low priority catchments)							App B p12	Jul 1 2020			✓		
Detailed MS4 mapping							App B p3	Jul 1 2020			✓		
Inspect all catch basins in Priority Areas							36	Jul 1 2020			✓		
Review regulations for LID barriers							27	Jul 1 2021				✓	
Legal authority for SW retention standards							27	Jul 1 2021				✓	
Monitor 6 'worst' outfalls to impaired waters annually							43	Jul 1 2021				✓	✓
Implement projects from retrofit plan							33	Jul 1 2021				✓	✓
Inspect all catch basins outside Priority Areas							36	Jul 1 2022					✓
2% impervious disconnection goal							33	Jul 1 2022					✓
Screen all outfalls to impaired waters							44	Jul 1 2022			50%		✓

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CENTER FOR LAND USE EDUCATION AND RESEARCH & CT NEMO

Connecticut MS4 Guide

Basics Tasks Tools

About MS4 News NEMO CLEAR

Basics

Important Dates & Deadlines

The overall effective dates of the permit are July 1, 2017 through June 30, 2022.

We developed an MS4 tasklist that may help you with MS4 planning. Because many deadlines are different between new and existing MS4 communities there are two versions - one for existing (2004) MS4 towns and another for new (2017) MS4 towns. Email Amanda if you'd like the original excel file instead of the pdfs posted here.

Existing MS4 tasklist New MS4 tasklist

Download (131 KB)

MS4 Tasks for 2004 Permittees

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<http://nemo.uconn.edu/ms4>

Tools & Templates

- SMP, Annual Report, & IDDE Templates
- Legal authorities templates (soon)

The screenshot displays the NEMO website interface. At the top, the UConn logo and 'UNIVERSITY OF CONNECTICUT' are visible, along with a search bar and 'A-Z' link. Below this, the 'CENTER FOR LAND USE EDUCATION AND RESEARCH & CT NEMO' is noted. The main heading is 'Connecticut MS4 Guide'. A navigation bar includes 'Basics', 'Tasks', and 'Tools', with 'Tools' circled in red. The 'Tools' dropdown menu is open, showing a list of resources. The main content area features a large white box titled 'Illicit Discharge Detection and Elimination (IDDE) Program'. This box contains placeholders for '##MUNICIPALITY', '##DATE', and '##TOWN SEAL'. Below these, a table titled '1.1 BMP Summary' is partially visible, showing columns for 'BMP', 'Status', and 'Activities in current period'. The table includes rows for '1-1 Implement public education and outreach' and '1-2 Address education/ outreach for pollutants of concern'. A red box highlights a section titled 'Example Additional BMP: 1-3 Integrate water quality into school curriculum'. At the bottom of the white box, a disclaimer states: 'This document is based on a template originally created by Fuss & O'Neill and modified for statewide use with the CTDEEP General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems, effective July 1, 2017.' The footer of the website shows 'Powered by feedwind'.

<http://nemo.uconn.edu/ms4>

Tools & Templates

- SMP, Annual Report, & IDDE Templates
- Legal authorities templates (soon)
- Recorded webinars

The screenshot shows the UConn NEMO website. The header includes the UConn logo and the text 'UNIVERSITY OF CONNECTICUT'. Below this is the 'CENTER FOR LAND USE EDUCATION AND RESEARCH & CT NEMO'. The main navigation bar has links for 'Basics', 'Tasks', 'Tools' (circled in red), 'About', 'MS4 News', 'NEMO', and 'CLEAR'. The 'Tools' dropdown menu is open, showing options like 'SMP', 'Annual Report', 'IDDE', 'Legal Authorities', 'Templates', 'Webinars', 'Maps', 'Forms', 'Tools', and 'Resources'. The main content area is titled 'Connecticut MS4 Guide' and features a 'Webinar Archive' section. The first webinar is 'CT Department of Transportation "MS4" Permit' by Adam Fox and Dan Imig, recorded on July 10, 2018. The second is 'CT MS4 Year 2 Tasks' by Dave Dickson, recorded on June 26, 2018. Below the webinars is the 'MS4 Map' section and a link to 'CT MS4 Mapping Details, Clarifications, and Tools'.

<http://nemo.uconn.edu/ms4>

Tools & Templates

- SMP, Annual Report, & IDDE Templates
- Legal authorities templates (soon)
- Recorded webinars
- FAQs

<http://nemo.uconn.edu/ms4>

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Connecticut MS4 Guide

Navigation: [Home](#) [Basics](#) [Tasks](#) **[Tools](#)** [About](#) [MS4 News](#) [NEMO](#) [CLEAR](#)

Frequently Asked Questions

MS4 Program Basics

- Why is this permit needed?
- What towns and institutions are included in the MS4 permit?
- Is there funding available to help MS4s comply with the new permit requirements?
- How do I sign up for the MS4 listserv?
- Is the CT Department of Transportation included?

General MS4 Questions

- What are Priority Areas?
- What is considered a surface water for purposes of the permit?
- Who is usually responsible for enforcing the IDDE ordinance?

Annual Reports and the Stormwater Management Plan

- When are things due to DEEP?
- Are templates available?
- Is there a list of recommended consultants that can help with developing and implementing the Stormwater Management Plan?
- Where should the public send comments on our Stormwater Management Plan?

Mapping

- What is DCIA?
- How do you calculate DCIA?
- What does it mean to disconnect an impervious area?

Water Quality Monitoring

- Is there a list of impaired waters for the purposes of the permit?
- How do I know which outfalls have to be screened/monitored?
- How can you distinguish human vs wildlife sources of bacteria impairment?
- Which type of Chlorine should towns sample for during the IDDE screening?

NEMO

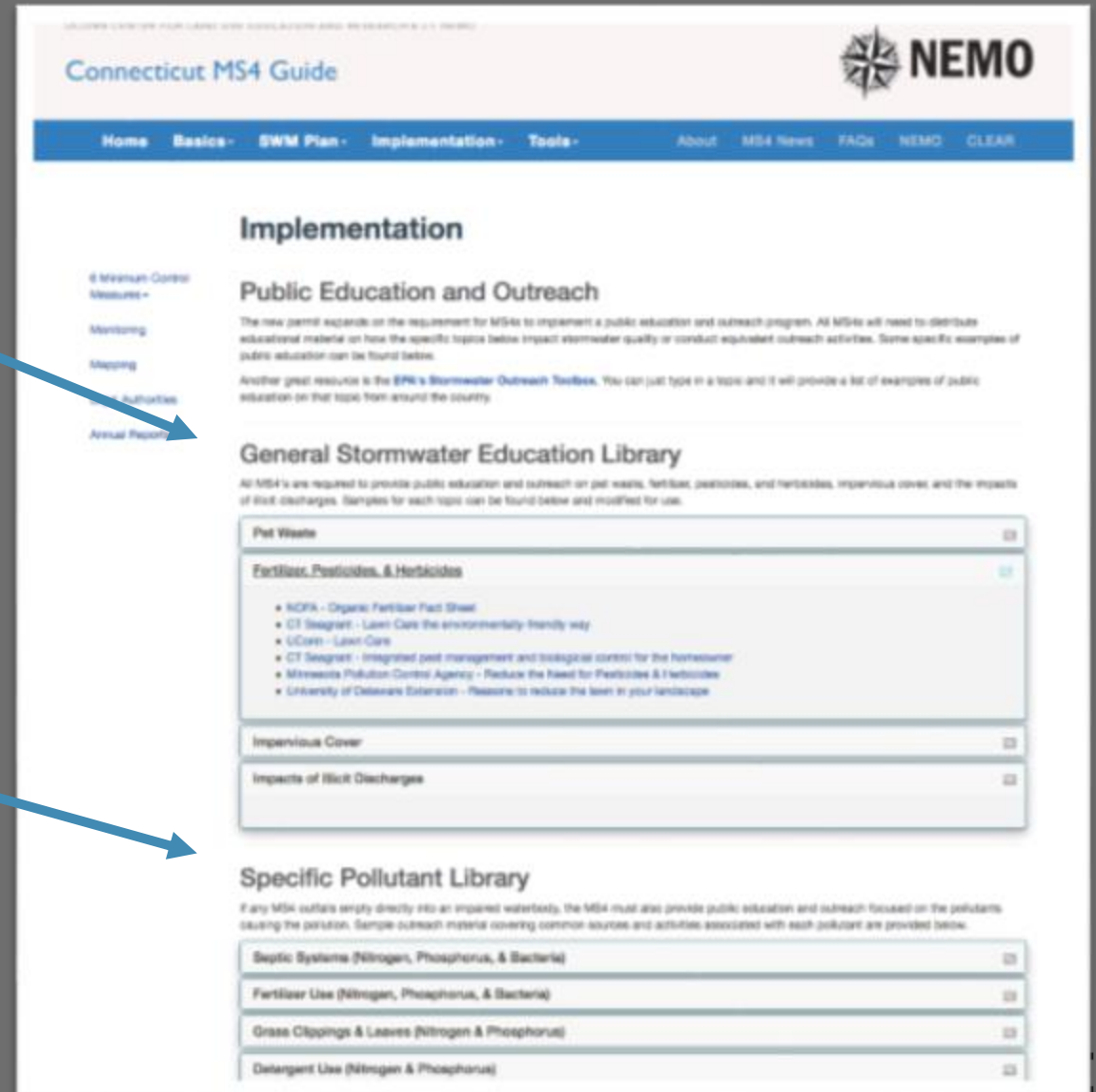
Public Education and Outreach Library

Required topics

- Pet waste
- Fertilizer, herbicides, and pesticides
- Impervious cover
- Illicit discharges

Additional topics

- Topics based on impairments for nitrogen, phosphorus, bacteria, mercury



The screenshot displays the 'Connecticut MS4 Guide' website. The navigation bar includes links for Home, Basics, SWM Plan, Implementation, Tools, About, MS4 News, FAQs, NEMO, and CLEAR. The 'Implementation' section is active, showing a sidebar with links for Stormwater Control Measures, Monitoring, Mapping, Local Authorities, and Annual Reports. The main content area is titled 'Public Education and Outreach' and explains the requirements for MS4s to implement a public education program. It lists required topics: Pet Waste, Fertilizer, Pesticides, & Herbicides, Impervious Cover, and Impacts of Illicit Discharges. Below these are links to a 'General Stormwater Education Library' and a 'Specific Pollutant Library' which includes sections for Septic Systems, Fertilizer Use, Grass Clippings & Leaves, and Detergent Use.

Connecticut MS4 Guide

Implementation

Public Education and Outreach

The new permit expands on the requirement for MS4s to implement a public education and outreach program. All MS4s will need to distribute educational material on how the specific topics below impact stormwater quality or conduct equivalent outreach activities. Some specific examples of public education can be found below.

Another great resource is the **EPA's Stormwater Outreach Toolbox**. You can just type in a topic and it will provide a list of examples of public education on that topic from around the country.

General Stormwater Education Library

All MS4's are required to provide public education and outreach on pet waste, fertilizer, pesticides, and herbicides, impervious cover, and the impacts of illicit discharges. Samples for each topic can be found below and modified for use.

- Pet Waste**
- Fertilizer, Pesticides, & Herbicides**
 - NRPA - Organic Fertilizer Fact Sheet
 - CT Seagreat - Lawn Care the environmentally friendly way
 - UConn - Lawn Care
 - CT Seagreat - Integrated pest management and biological control for the homeowner
 - Minnesota Pollution Control Agency - Reduce the Need for Pesticides & Herbicides
 - University of Delaware Extension - Reasons to reduce the lawn in your landscape
- Impervious Cover**
- Impacts of Illicit Discharges**

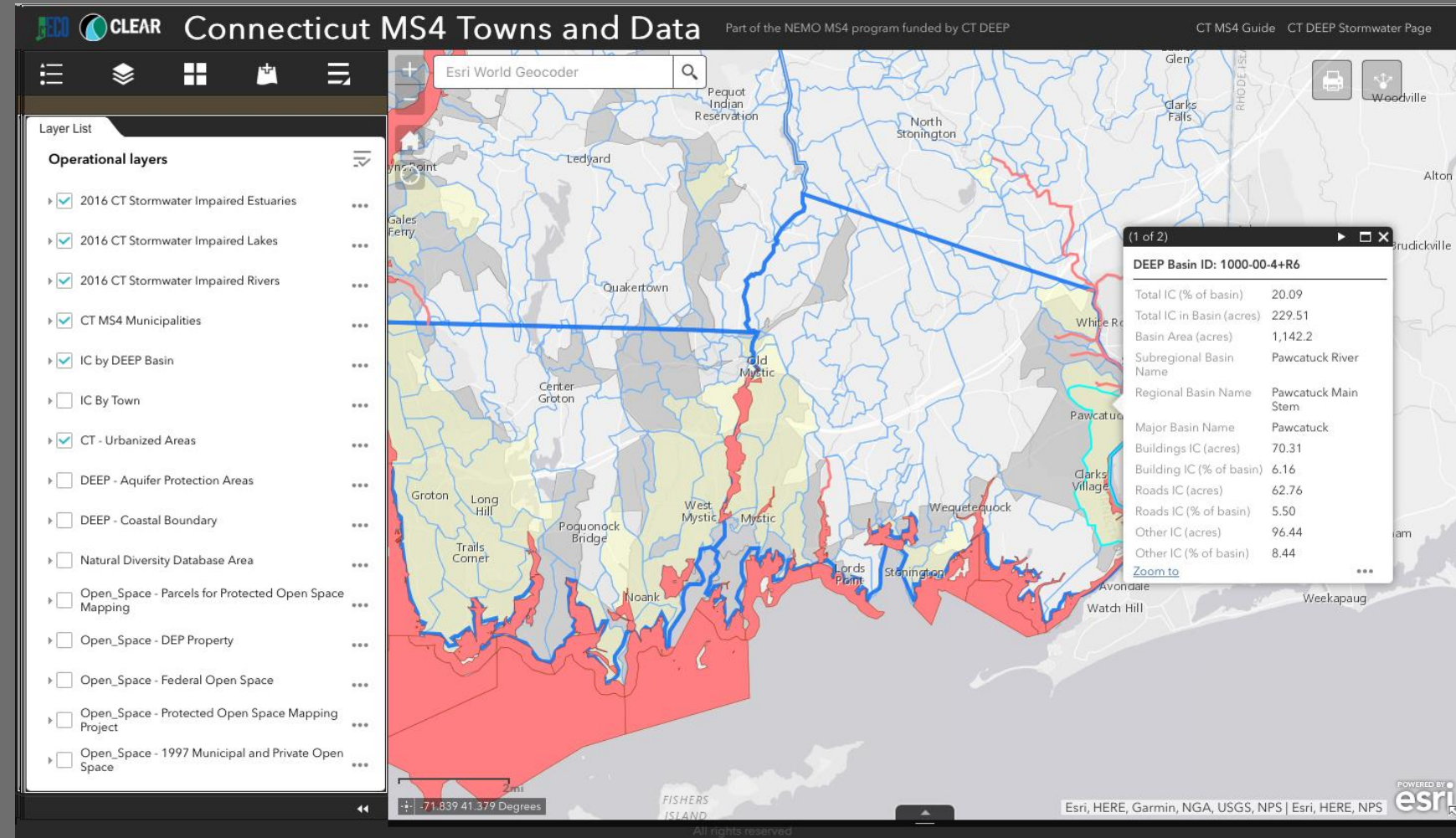
Specific Pollutant Library

If any MS4 outfalls effluent directly into an impaired waterbody, the MS4 must also provide public education and outreach focused on the pollutants causing the pollution. Sample outreach material covering common sources and activities associated with each pollutant are provided below.

- Septic Systems (Nitrogen, Phosphorus, & Bacteria)**
- Fertilizer Use (Nitrogen, Phosphorus, & Bacteria)**
- Grass Clippings & Leaves (Nitrogen & Phosphorus)**
- Detergent Use (Nitrogen & Phosphorus)**

MS4 Map Viewer

- Urbanized Area
- MS4 Impaired Waters
- New HR IC Data
- By Basin
- By Town



<http://s.uconn.edu/ctms4map>

Mapping Your Stormwater System

- **Outfalls & interconnections**
 - All outfalls (townwide, regardless of size)
 - Due Date
 - **July 1, 2019** (existing MS4s)
 - **July 1, 2020** (new MS4s)
- **Entire system**
 - In priority areas
 - Due Date
 - **July 1, 2020** (existing MS4s)
 - **July 1, 2022** (new MS4s)



MS4 Mapping Workshop

Map & Disconnect Impervious Cover

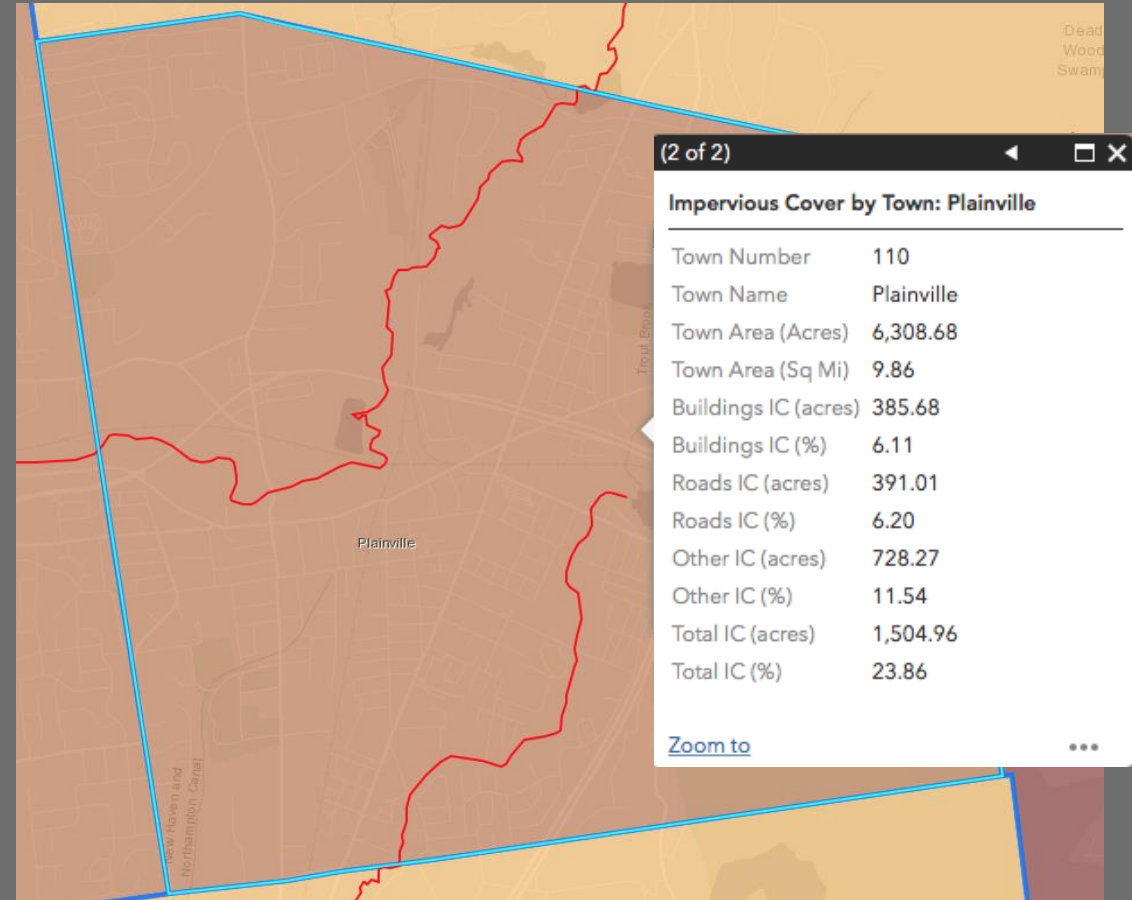
- Establish baseline estimate of connected impervious cover
- Develop plan to disconnect 2% by 2022
- Track disconnections



Disconnected Impervious

Map & Disconnect Impervious Cover

- Establish baseline estimate of connected impervious cover
- Develop plan to disconnect 2% by 2022
- Track disconnections
- New Statewide High-Res IC Data



Map & Disconnect Impervious Cover

- Establish baseline estimate of connected impervious cover
- Develop plan to disconnect 2% by 2022
- Track disconnections
- New Statewide High-Res IC Data
- Mapping workshop recordings



Water Quality Monitoring

Two monitoring requirements:

- Impaired waters
- IDDE

☆ Helpful resources

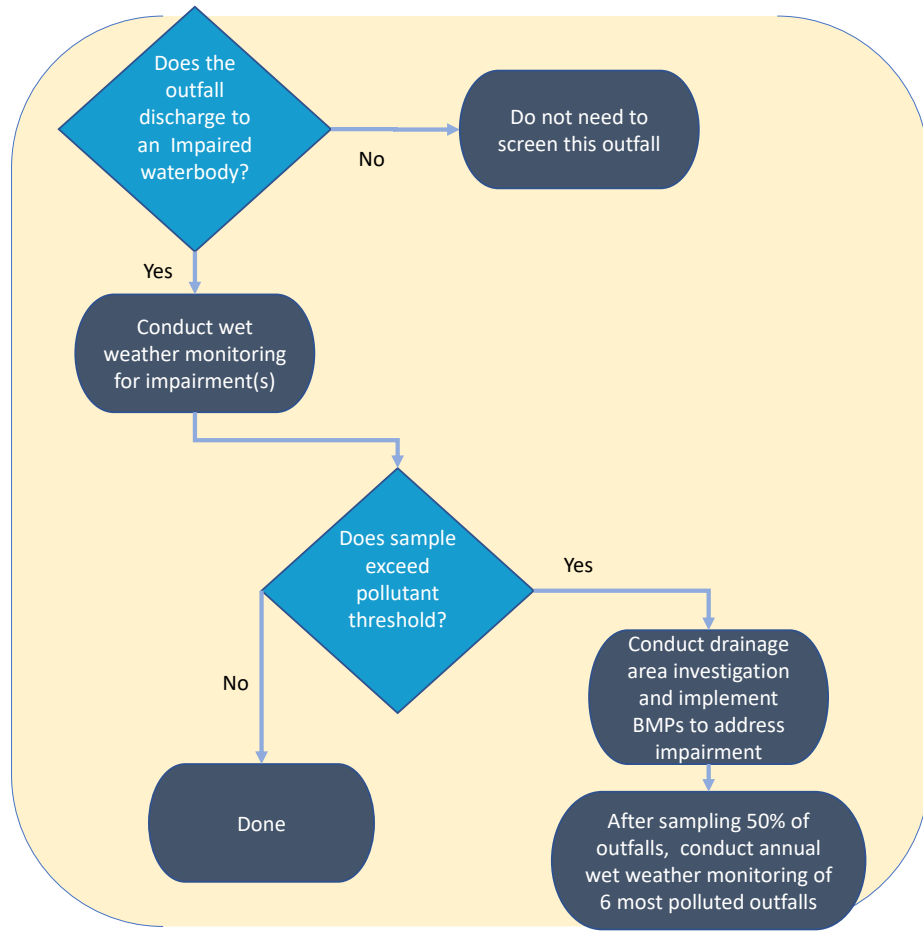
- MS4 Monitoring webpage
- MS4 Map viewer

MS4 Monitoring Requirement Comparison

	Impaired waters monitoring	Baseline monitoring (IDDE)	Catchment Investigation Procedure (IDDE)
area covered	All outfalls to Stormwater impaired waters	Outfalls in priority areas (urbanized area, discharges to impaired waters or in basin where DCIA > 11%) that are categorized as either high or low priority catchments (see IDDE section of this website or appendix B of permit for more information)	Problem, High Priority and Low Priority catchments in the priority area. Those with at least one SVF to be investigated and screened.
type of sampling	wet weather	dry weather for initial baseline screening	dry weather manhole investigation wet weather screening at outfall for catchment with at least one SVF
pollutant(s) to screen for	The listed stormwater pollutant of concern (nitrogen, phosphorus, bacteria, or other pollutant of concern). Note that for waters impaired by 'other pollutant of concern' screen for turbidity.	Listed stormwater pollutants of concern (if any), PLUS: ammonia chlorine conductivity salinity <i>E. coli.</i> (freshwater) or enterococcus (saline or brackish receiving water) surfactants temperature	Dry wx: ammonia, chlorine, and surfactants Wet wx: listed impairment pollutant(s) (if any), PLUS ammonia chlorine conductivity salinity <i>E. coli.</i> (freshwater) or enterococcus (saline or brackish receiving water) surfactants temperature

Water Quality Monitoring

Impaired waters outfall monitoring

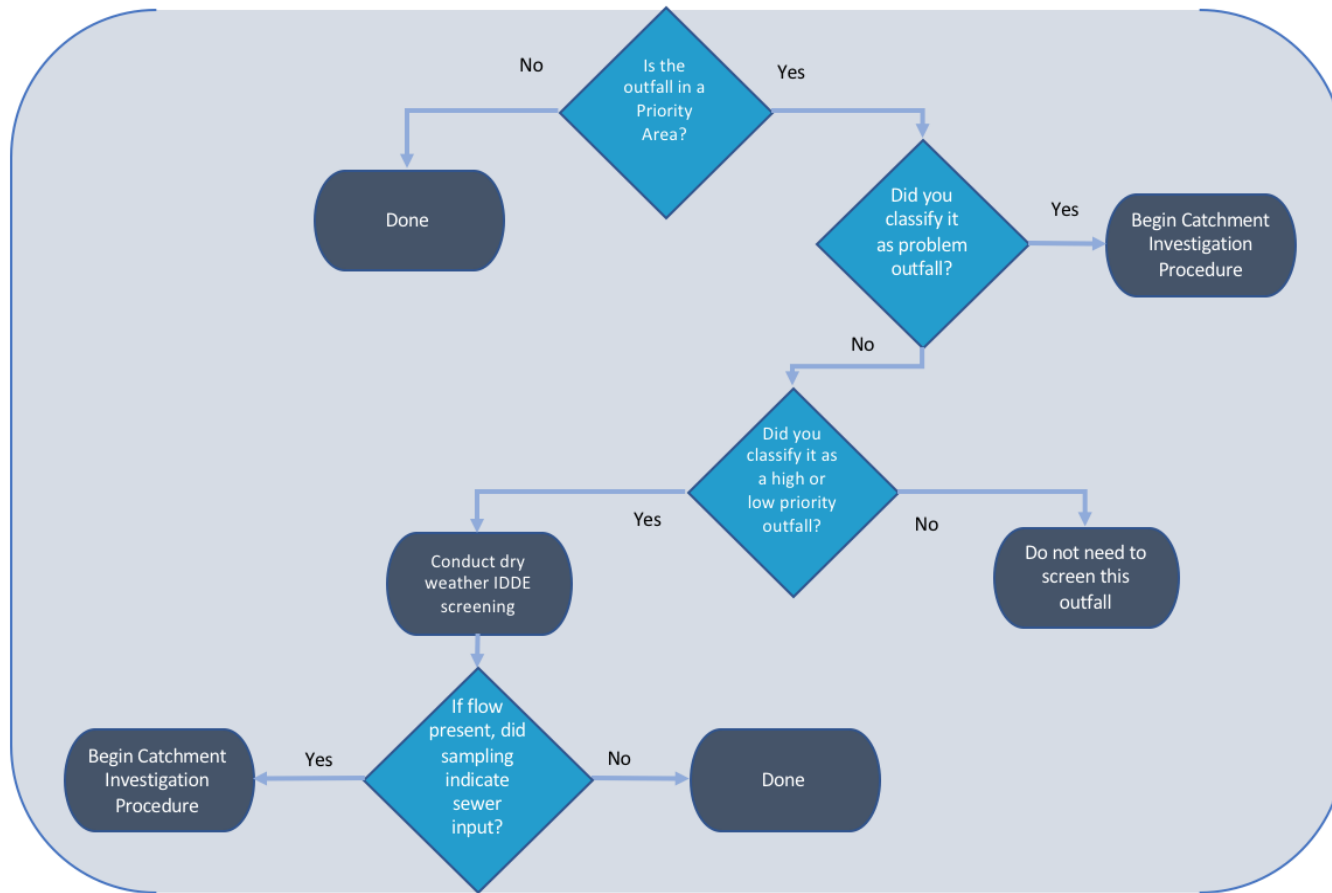


MS4 Monitoring Requirement Comparison

	Impaired waters monitoring	Baseline monitoring (IDDE)	Catchment Investigation Procedure (IDDE)
red	All outfalls to Stormwater impaired waters	Outfalls in priority areas (urbanized area, discharges to impaired waters or in basin where DCIA > 11%) that are categorized as either high or low priority catchments (see IDDE section of this website or appendix B of permit for more information)	Problem, High Priority and Low Priority catchments in the priority area. Those with at least one SVF to be investigated and screened.
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Water Quality Monitoring

IDDE baseline monitoring

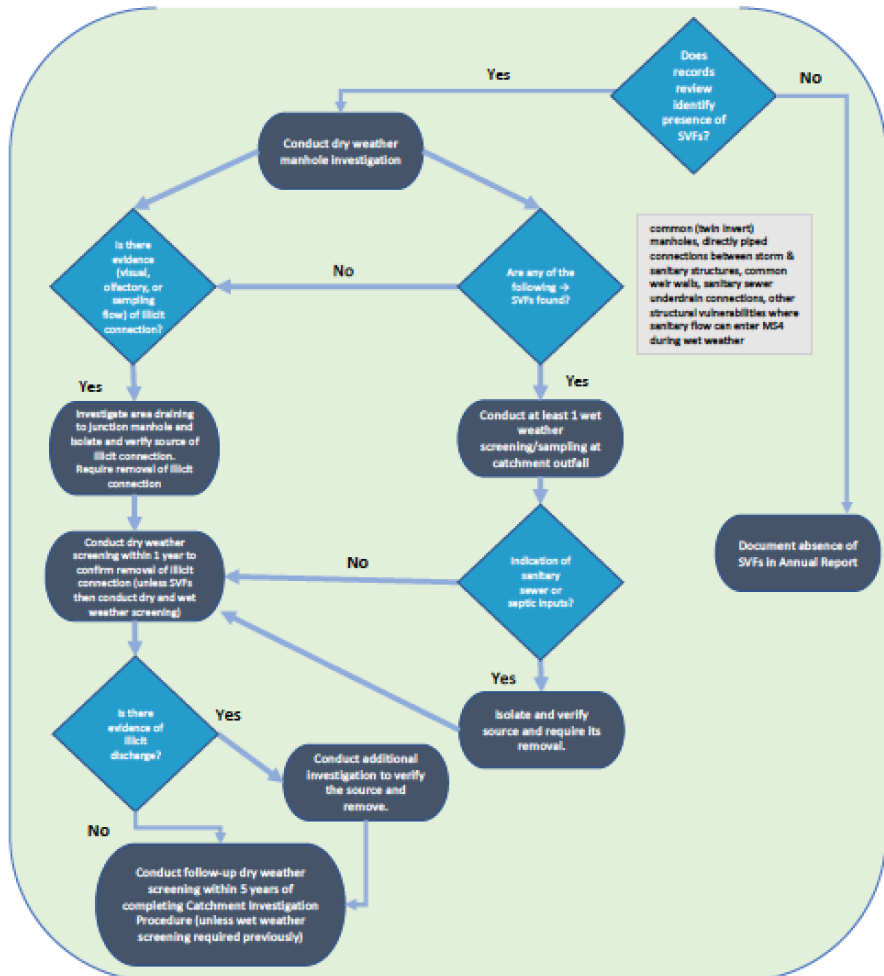


Monitoring Requirement Comparison

Monitoring	Baseline monitoring (IDDE)	Catchment Investigation Procedure (IDDE)
Outfalls	Outfalls in priority areas (urbanized area, discharges to impaired waters or in basin where DCIA > 11%) that are categorized as either high or low priority catchments (see IDDE section of this website or appendix B of permit for more information)	Problem, High Priority and Low Priority catchments in the priority area. Those with at least one SVF to be investigated and screened.
Screening	Dry weather for initial baseline screening	Dry weather manhole investigation Wet weather screening at outfall for catchment with at least one SVF
Parameters (nitrogen, phosphorus, etc.)	Listed stormwater pollutants of concern (if any), PLUS: ammonia chlorine conductivity salinity E. coli. (freshwater) or enterococcus (saline or brackish receiving water) surfactants temperature	Dry wx: ammonia, chlorine, and surfactants Wet wx: listed impairment pollutant(s) (if any), PLUS ammonia chlorine conductivity salinity E. coli. (freshwater) or enterococcus (saline or brackish receiving water) surfactants temperature

Water Quality Monitoring

IDDE Catchment Investigation Procedure

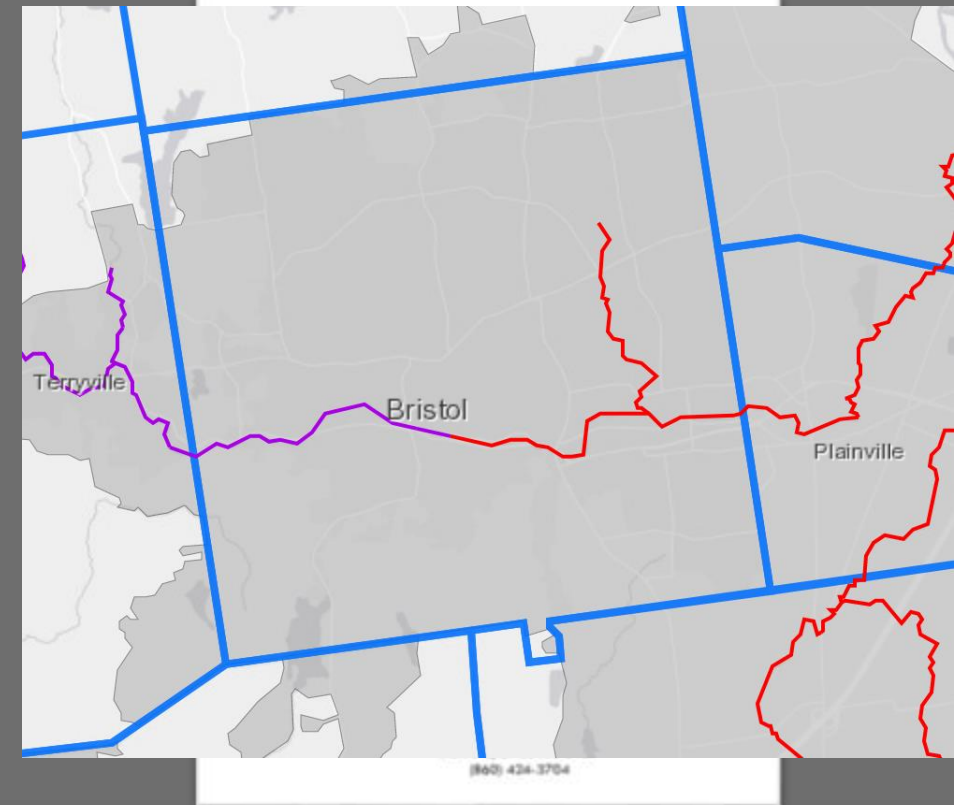


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Water Quality Monitoring – Identifying Impaired Waters

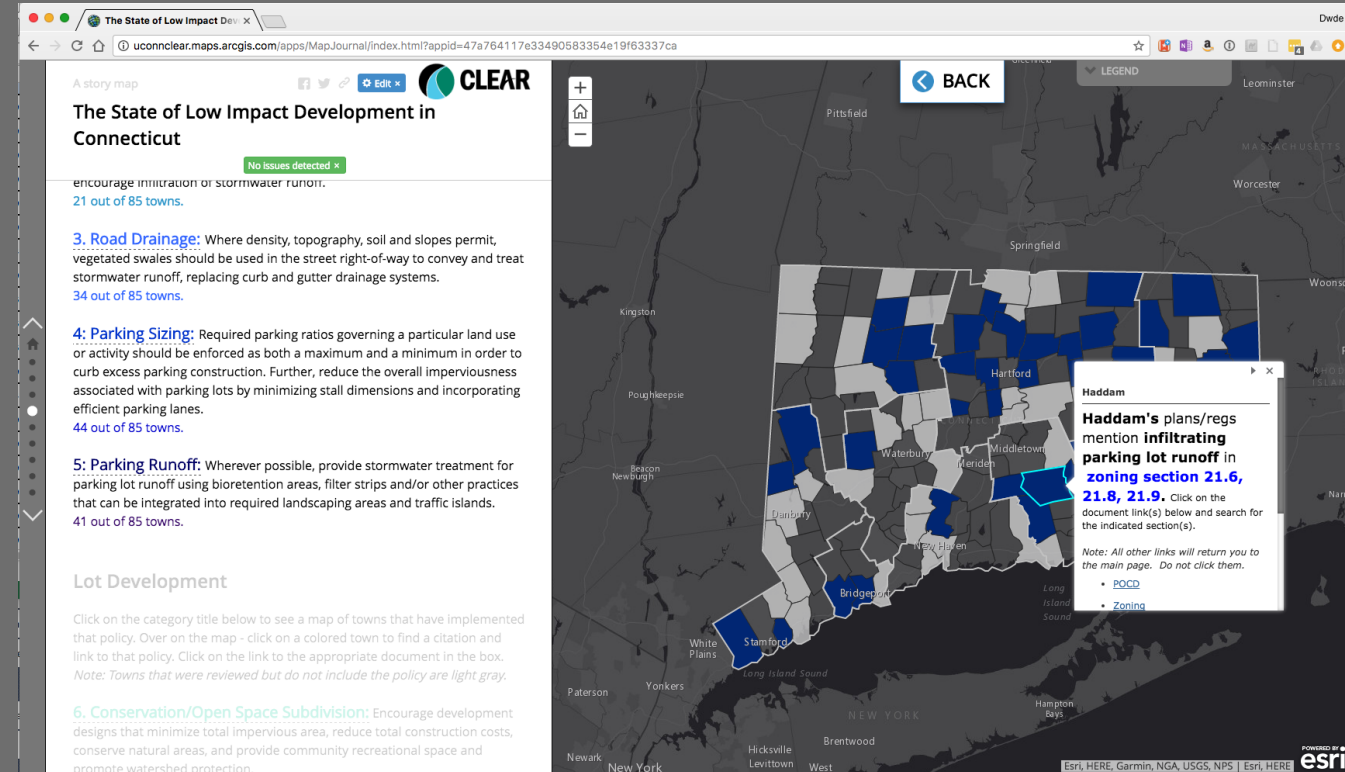
- Know the impaired waters in municipality/institution
 - <http://s.uconn.edu/ctms4map>
- Begin monitoring outfalls to impaired waters by:
 - July 2018 – Existing MS4
 - July 2019 – New MS4



- **Red** – use for determining priority area *and* for impaired waters monitoring
- **Purple** – impaired waters monitoring only

Updating Land Use Regulations

- Remove obstacles to LID
- Establish LID as preferred approach
- 2% disconnect by 2022
- Site redevelopment retention standards



<http://s.uconn.edu/stateoflid>

Future Workshop/Webinar Topics

- LID Isn't Scary Tour – Oct. 30



LID Isn't Scary! A Walking Workshop on LID & LID Maintenance for Public Works Staff & Others

This "walking workshop" (a.k.a guided tour) of green stormwater infrastructure at UConn will demonstrate that installing AND maintaining low impact development (LID) practices doesn't have to be scary. The University of Connecticut has been using bioretention, green roofs, and several types of pervious pavements for a decade to reduce stormwater runoff and its impacts. Join us to visit these practices and learn how and where they work, where they don't, and how they are maintained. In addition to CLEAR/NEMO faculty, public works staff from UConn will be available to answer specific questions regarding equipment, practices, and lessons learned. Costumes optional.

Tuesday, October 30

1:00 – 3:00 pm

Park in the North Garage
(2152 Hillside Rd, Storrs, CT)

Meet on the rear patio of the
UConn Student Union



Questions? Contact David.Dickson@uconn.edu.

Register to attend: <http://s.uconn.edu/lidtour>





This tour is part of NEMO's MS4 Program, supported by CT DEEP

Future Workshop/Webinar Topics

- LID Isn't Scary Tour – Oct. 30
- Stormwater Collaboratives

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[Educators](#)
[Kids](#)
[Documents](#)
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CENTRAL MASSACHUSETTS REGIONAL STORMWATER COALITION

Massachusetts Statewide Stormwater Coalition

[Printer-Friendly Version](#)

The Central Massachusetts Regional Stormwater Coalition (CMRSWC) is pleased to report the regional forum for municipal stormwater management collaboration expanded on June 23, 2015.

At a meeting coordinated by MassDEP's Andrea Briggs and hosted at the Department's Central Regional Office in Worcester, the CMRSWC and five other stormwater collaborative groups present unanimously agreed to create an informal (for now at least) **Massachusetts Statewide Stormwater Coalition** to further share tools, manage costs, and improve inter-community and inter-watershed collaboration.

The six municipal stormwater collaboratives that are participating in the **Massachusetts Statewide Stormwater Coalition** are:

1. The Central Massachusetts Regional Stormwater Coalition- CMRSWC (this website)
2. The [Merrimack Valley Stormwater Collaborative](#)
3. The [Neponset Stormwater Partnership](#) (Neponset Valley Regional Stormwater Collaborative)
4. The [Northern Middlesex Stormwater Collaborative](#)
5. The [Connecticut River Stormwater Committee](#)
6. The [North and South Rivers Watershed Association](#)


Two additional regional stormwater groups, the [MetrolWest Regional Collaborative](#) and the [Southeastern Regional Services Group](#) Stormwater Group are currently inactive, just forming, and/or are considering joining this Statewide group.

Together, these regional groups represent 90 active towns subject to regulation under the USEPA's Massachusetts Small MS4 Permit and another 28 towns that may participate with the Statewide Coalition in the near future.

Also attending the June 23 meeting were USEPA Region 1's Newton Tedder, MassDEP Deputy Commissioner Beth Card, and a number of other staff from both USEPA and MassDEP.

Below, we have provided resources on the many groups participating in this Massachusetts Statewide Stormwater Coalition, including contacts for each group and the scope of work each group is planning for municipal FY2016.

OVERVIEW	Meeting #2 Attendance Sheet
Scope of Each Member Coalition	Meeting #2 Minutes (in progress!)
Contacts for Each Member Coalition	
Map of Regional Stormwater Coalitions	
Map of Coalition Partners (Watershed Associations)	
MEETINGS	
Meeting #2 Agenda: Sept 17, 2015	
Meeting #2: Handout packet	
Draft Goals (for review)	




157 Main Street
Spencer, MA 01562
www.spencerma.gov

Virtual Town & Schools Website

Future Workshop/Webinar Topics

- LID Isn't Scary Tour – Oct. 30
- Stormwater Collaboratives
- Stormwater Utilities


City of New London
Connecticut

STORMWATER PROGRAM COSTS

Property Type	Units	Total IC	% of IC	Average IC	REU	Quarterly Cost	Revenue
Residential							
0-1000	286	191,916	0.47%	671	1	\$ 7.50	\$ 8,580
1000-2000	1930	3,021,388	7.42%	1,565	2	\$ 15.00	\$ 115,800
2000-3000	1520	3,705,912	9.10%	2,438	3	\$ 22.50	\$ 136,800
3000 +	1218	5,504,091	13.52%	4,519	5	\$ 37.50	\$ 182,700
Commercial	828	16,880,522	41.46%	20,387	20.4	\$ 152.90	\$ 506,416
Tax Exempt	168	7,078,629	17.39%	42,135	42.1	\$ 316.01	\$ 212,359
Municipal	112	4,330,290	10.64%	38,663	38.7	\$ 289.97	\$ 129,909
Totals	6062	40,712,748	100.00%				\$ 1,292,563
Residential Equivalent Unit = 1000 Square Feet (SF) of Impervious Cover (IC) = \$7.50							

Future Workshop/Webinar Topics

- LID Isn't Scary Tour – Oct. 30
- Stormwater Collaboratives
- Stormwater Utilities
- Your favorite (or least favorite) topic here



If you get stressed, remember MEP



Maximum Extent Practicable (MEP)

- Make a serious attempt to comply
- Don't reject practical solutions
- Attenuating factors:
 - MS4 size
 - Ability to finance
 - Capacity to perform operations & maintenance
 - Local conditions
 - Etc.

If MEP chanting fails . . .

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