



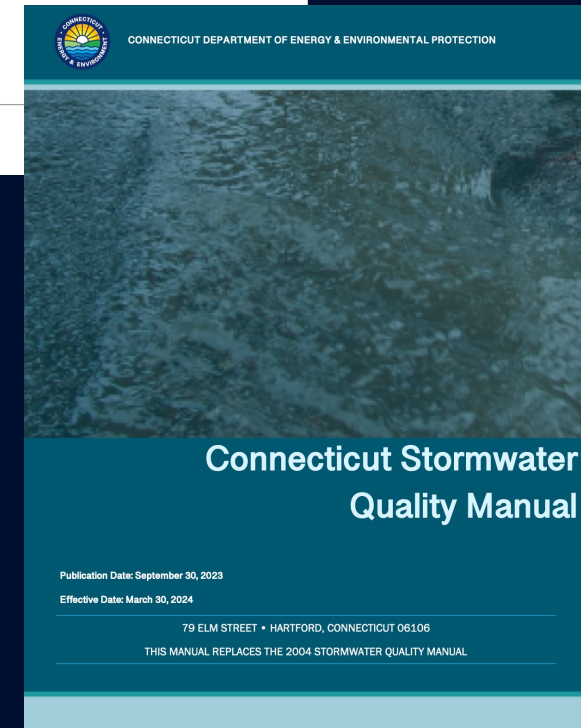
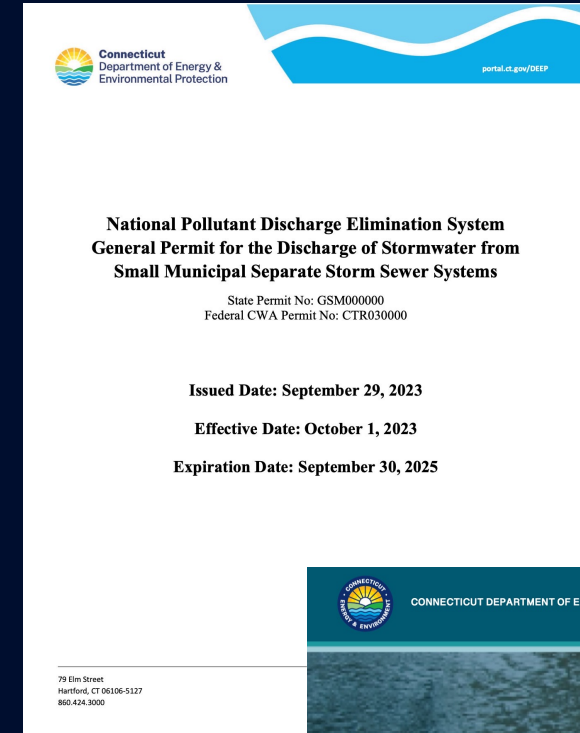
# An Update on Stormwater Management in Connecticut

Mary Looney, Dave Dickson  
CT NEMO



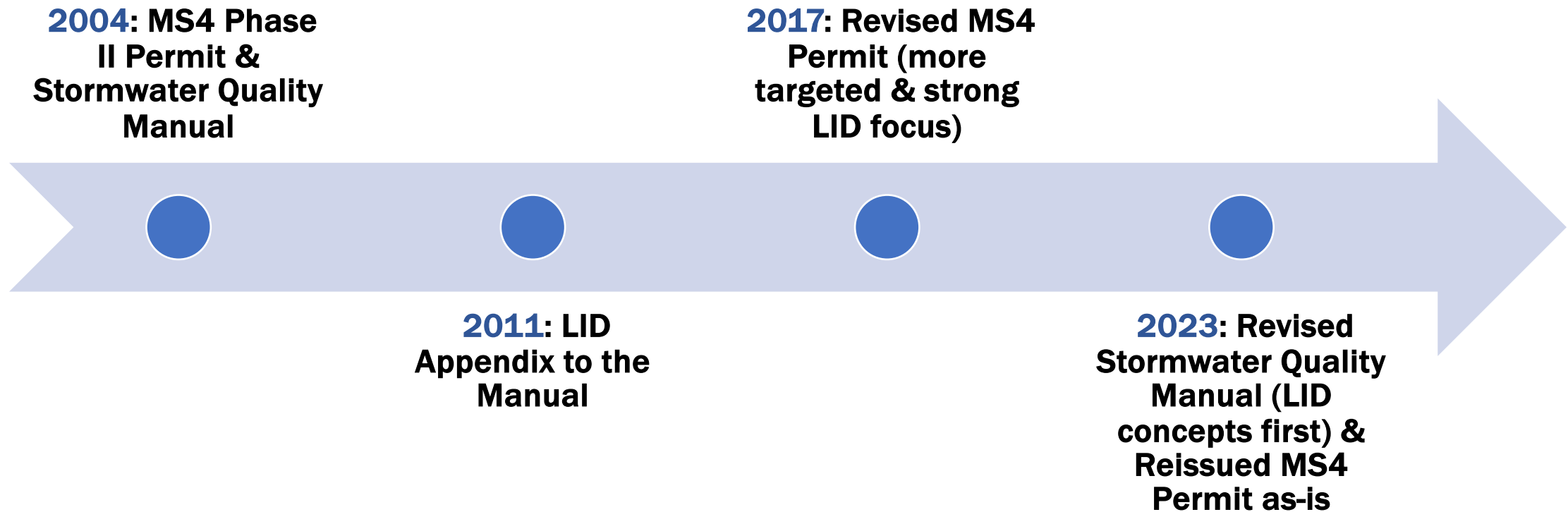
# Roadmap

- An Evolving Approach
- Town Progress & Feedback
- DEEP Takeaways & Opportunities
- A success story
- Looking forward - Resources
- Q & A





# Where we have been





# Low Impact Development

*Approach to site design & stormwater management that seeks to preserve pre-development hydrology and pollutant loads*

## Non-Structural LID

- Minimize site disturbance to natural features
- Protect natural drainage
- Minimize impervious surface
- Reduce need for pollutants
- Encourage infiltration

## Structural LID(GSI)

- Promote infiltration, evapotranspiration, and storage and reuse
- Bioretention/Rain Gardens
- Pervious pavements
- Green roofs
- Tree box filters
- Rain barrels/cisterns



# LID in the Permit

- Remove barriers in land use regs.
- Require developers consider LID **FIRST**
- Retention of WQV on site for new & redevelopment
- Disconnect 1% of DCIA/year

## Eno Memorial Hall

Artistic Rendering of the potential GSI practice on site

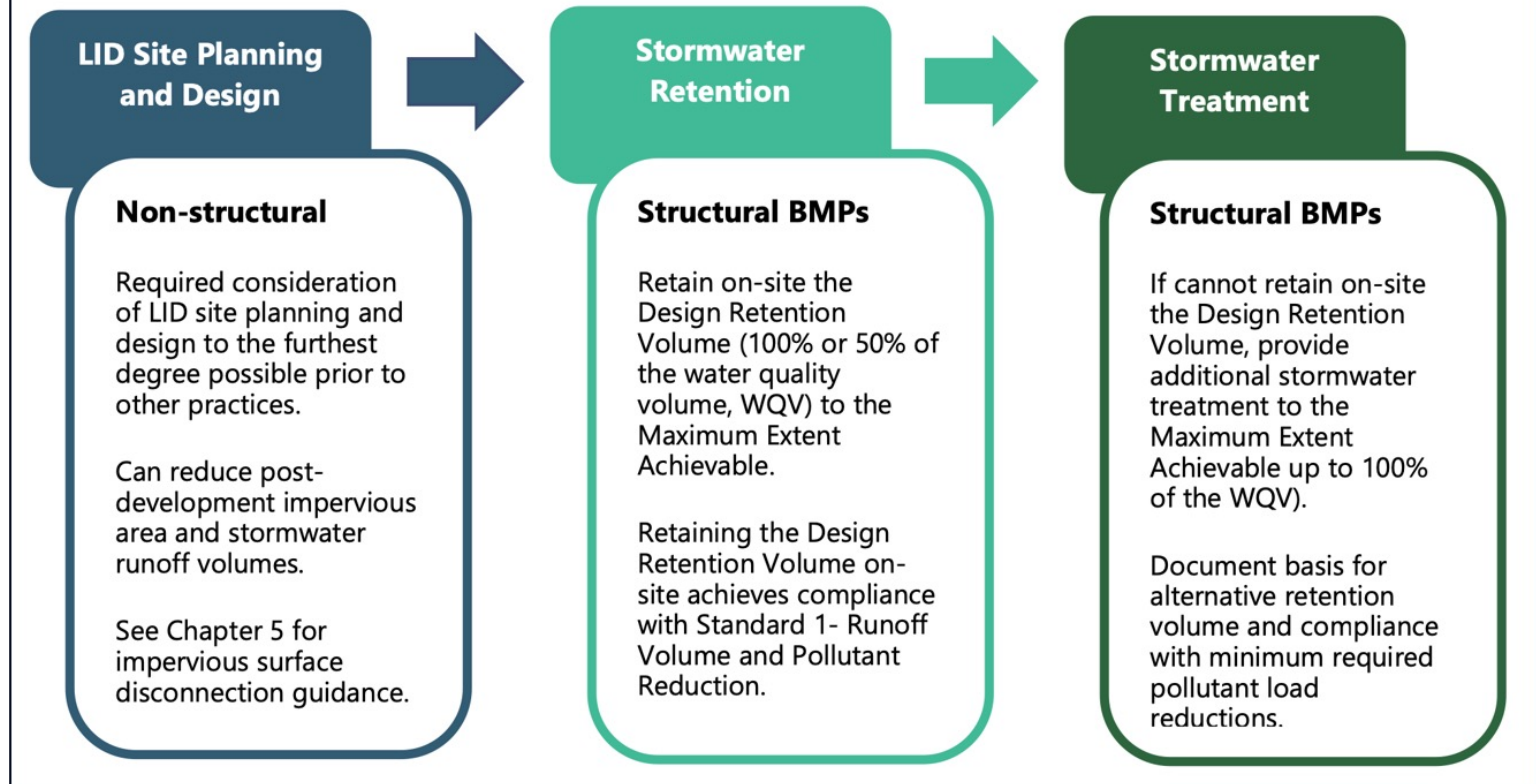




# Stormwater Quality Manual

- Consider LID (non-structural & Structural) **FIRST**
- Detailed flow chart to guide selection of practices
- Retrofit Chapter

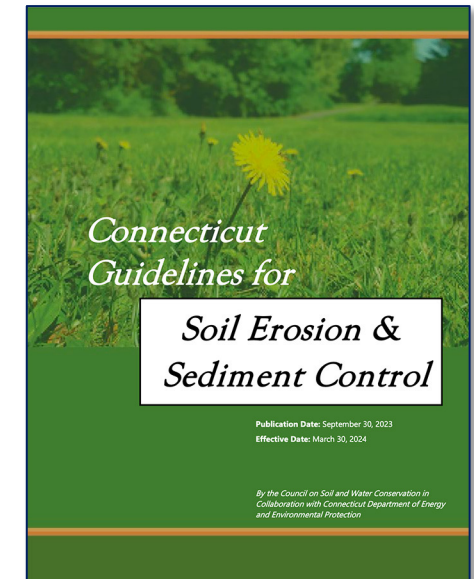
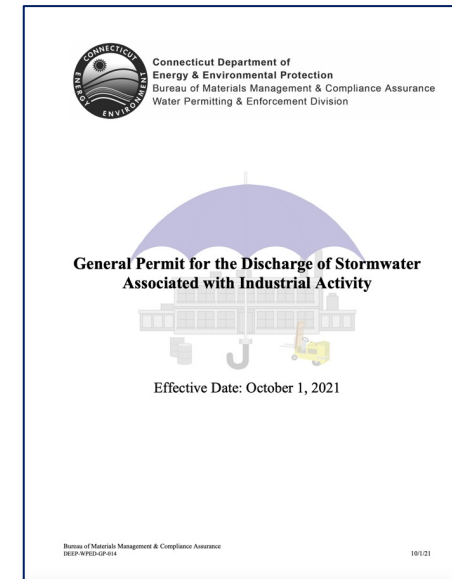
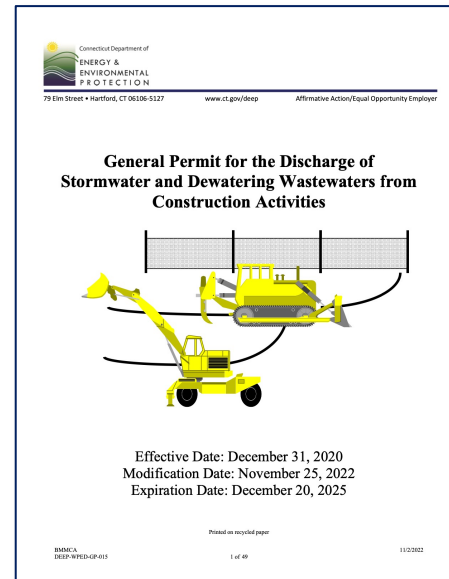
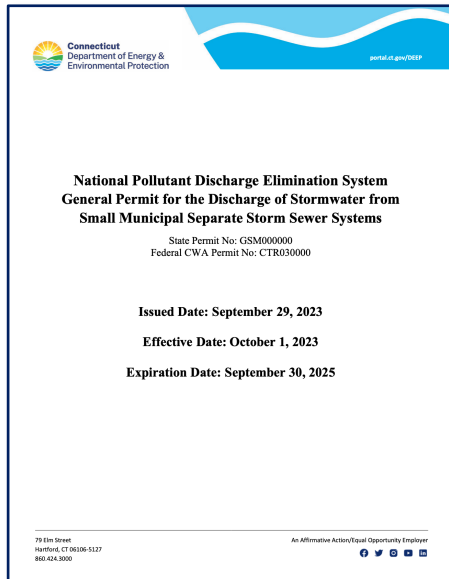
Figure 4-1. Runoff Volume and Pollutant Reduction (Standard 1) Elements and Process





# Objectives of the Updates - Consistency

- Improve consistency with the CT DEEP General Stormwater permits
  - MS4, Construction, Industrial, Commercial
- Improve consistency with Guidelines for Soil Erosion and Sediment Control



# NEMO's MS4 Support

Funded by DEEP penalty & grant money for 8 years

- MS4 educator
- website & listserv
- workshops & webinars
- maps & data
- Online SWQ Manual & webinars



Mary Looney



CTMS4-L Home Page

CTMS4-L@LISTSERV.UCONN.EDU

#### Latest Messages

MS4 Management & Reporting Software Demos

Re: MS4 website and stormwater management plan template now available

MS4 website and stormwater management plan template now available

#### CTMS4-L

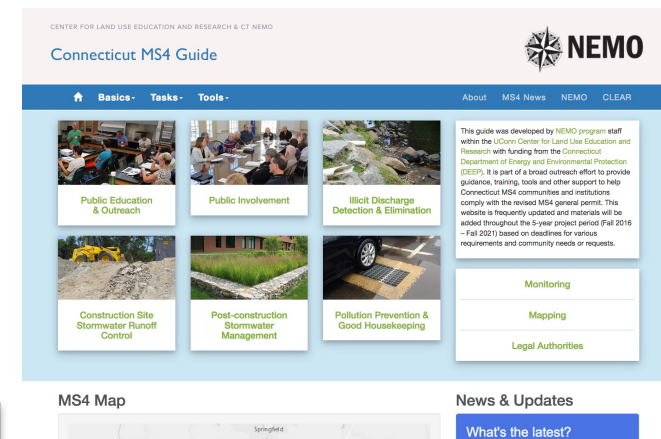
Forum for MS4 communities and institutions in CT

- February 2017
- January 2017
- December 2016
- November 2016
- October 2016

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



maps & data



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



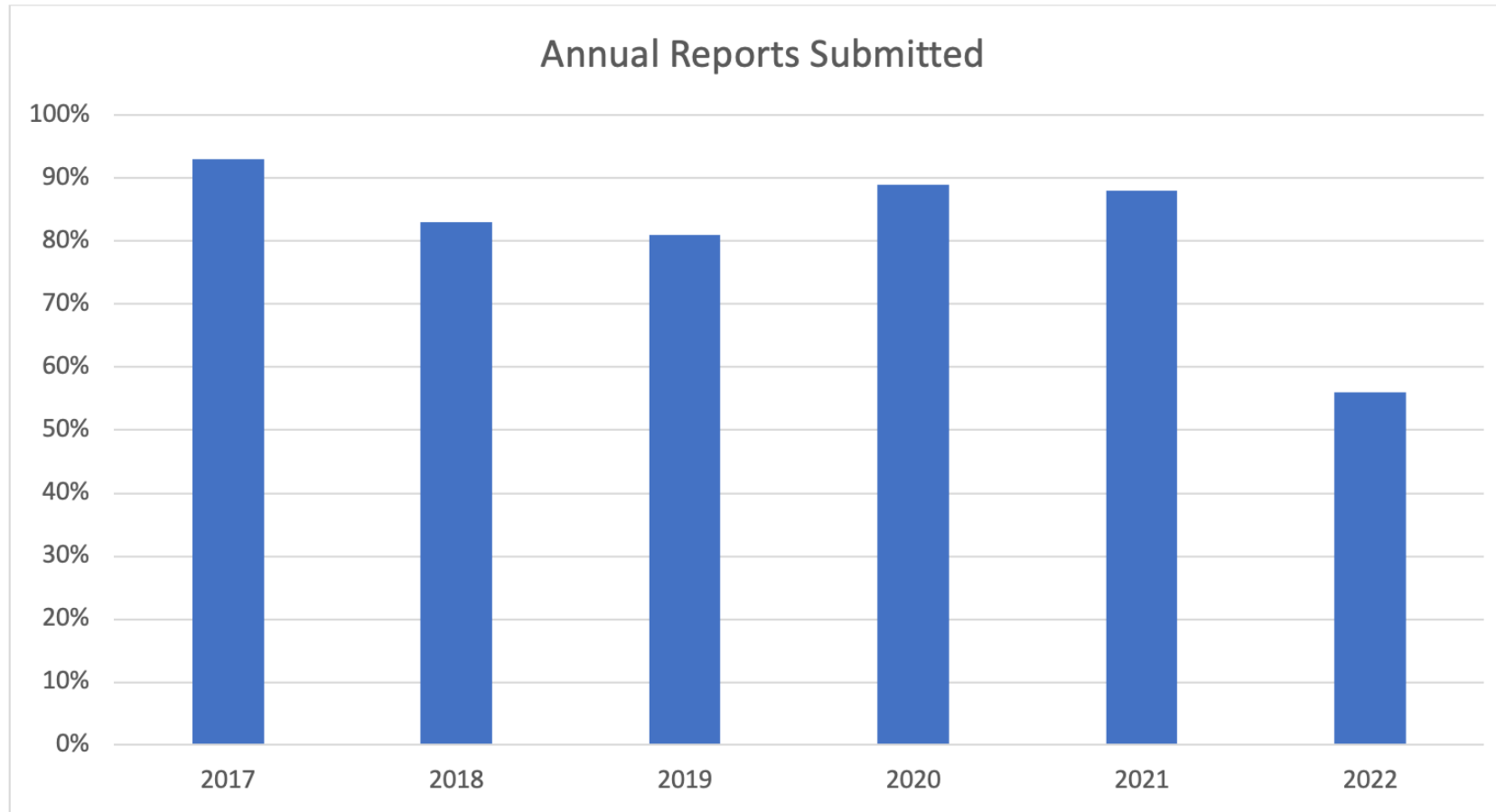
workshops & webinars



An aerial photograph of a modern university building with large glass windows and a paved walkway. The building is a multi-story structure with a mix of light-colored stone or concrete panels and large glass windows. The walkway is a wide, light-colored path that curves through the scene, with several people walking on it. The surrounding landscape includes green grass, some young trees, and a landscaped area with rocks and mulch. The text "MS4 progress to date" is overlaid in white, with a white underline, centered over the walkway.

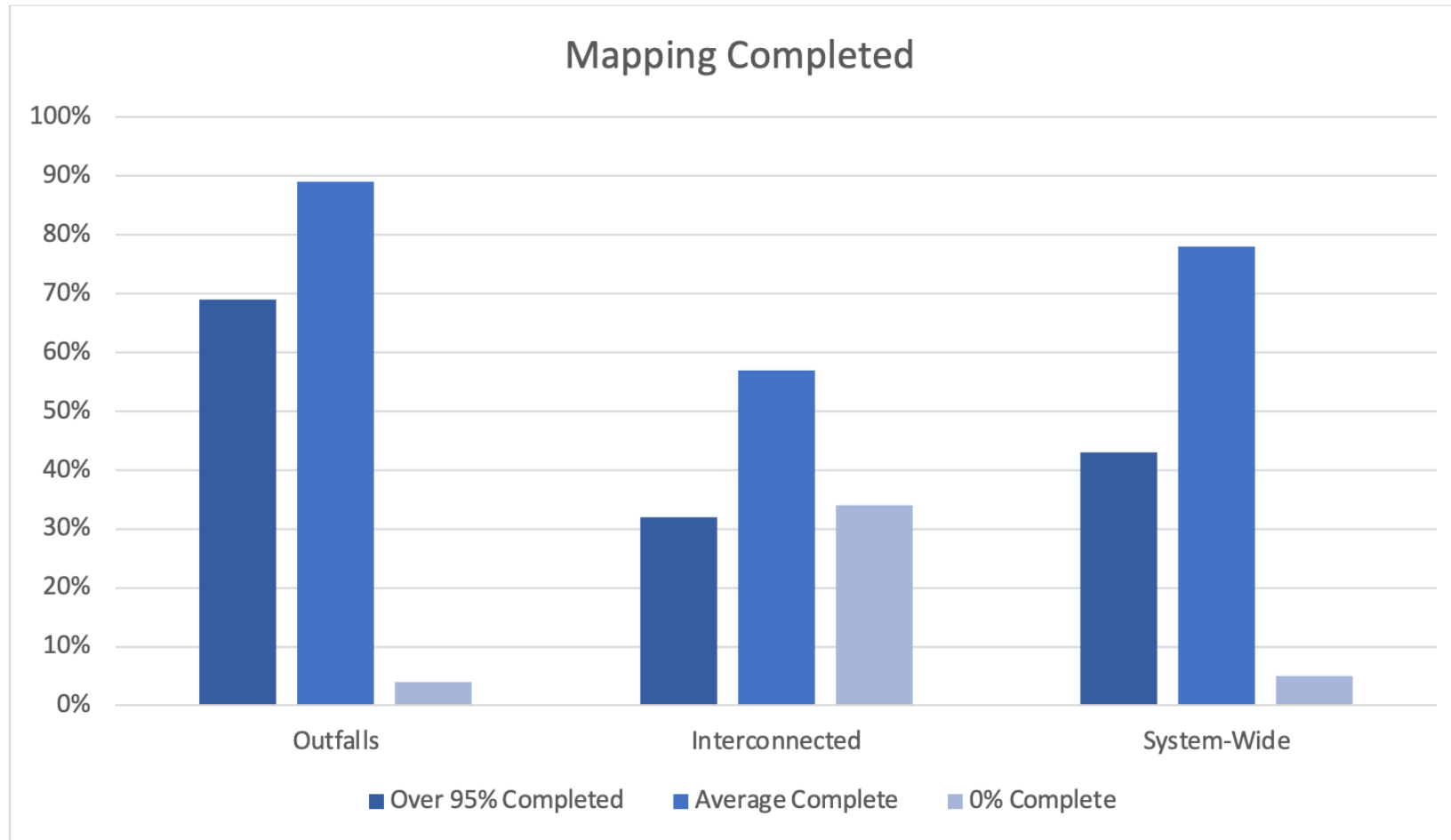
MS4 progress to date

# MS4 Compliance – Annual Reports



Data taken prior to 2022 submission deadline

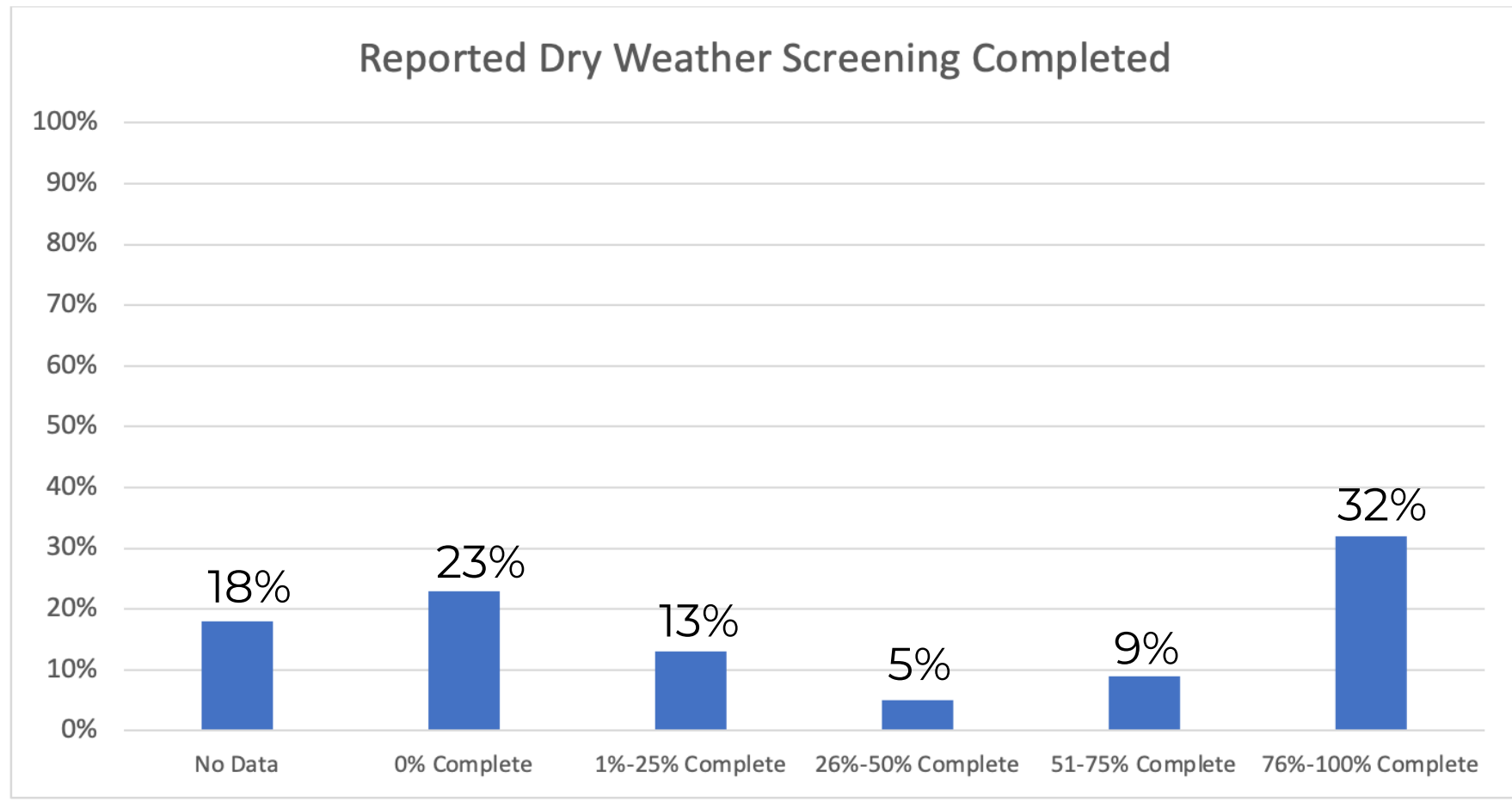
# MS4 Compliance – System Mapping



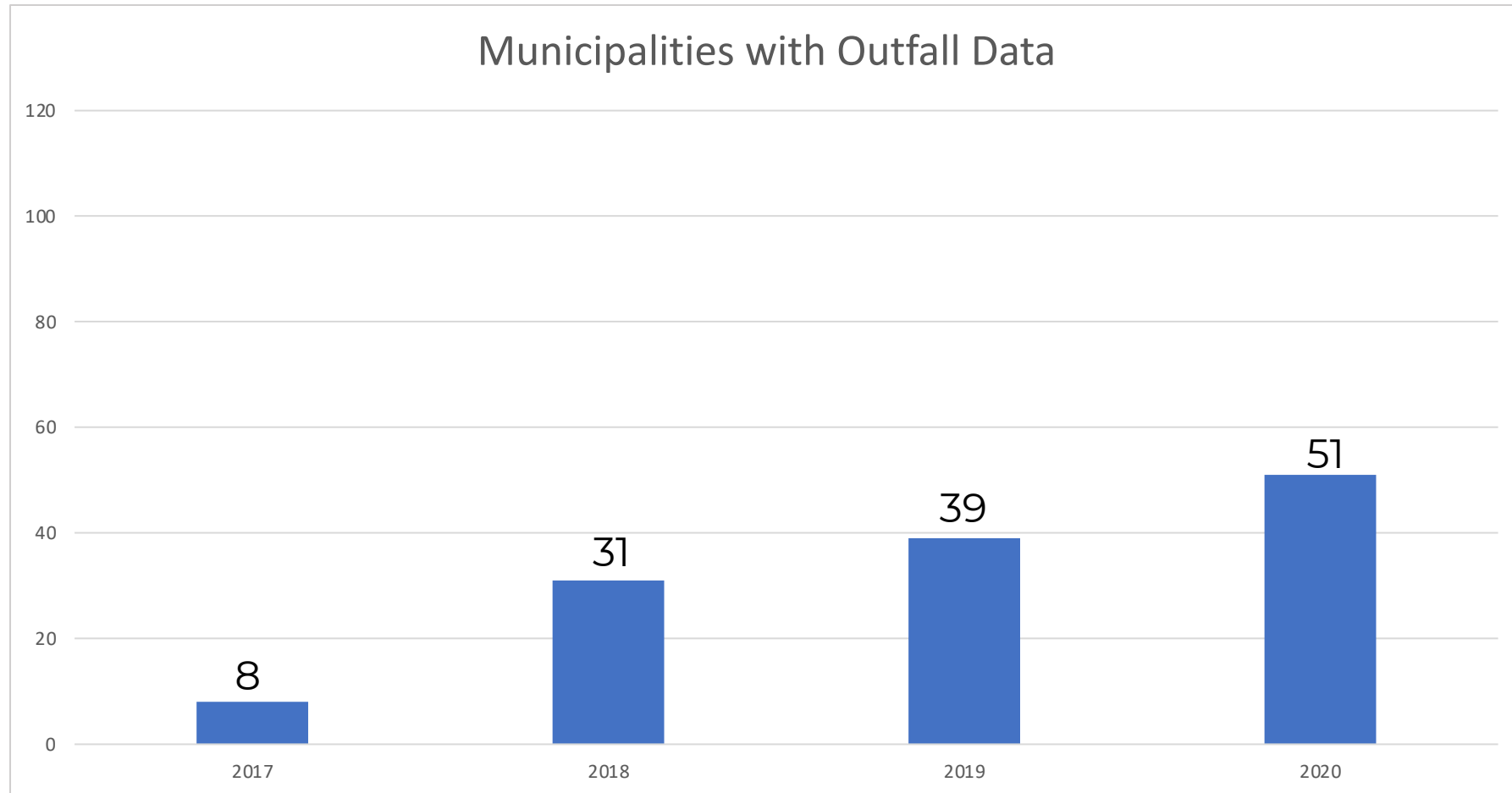
- Average amount of completed mapping: 89%
- 4% of towns have not started their outfall mapping



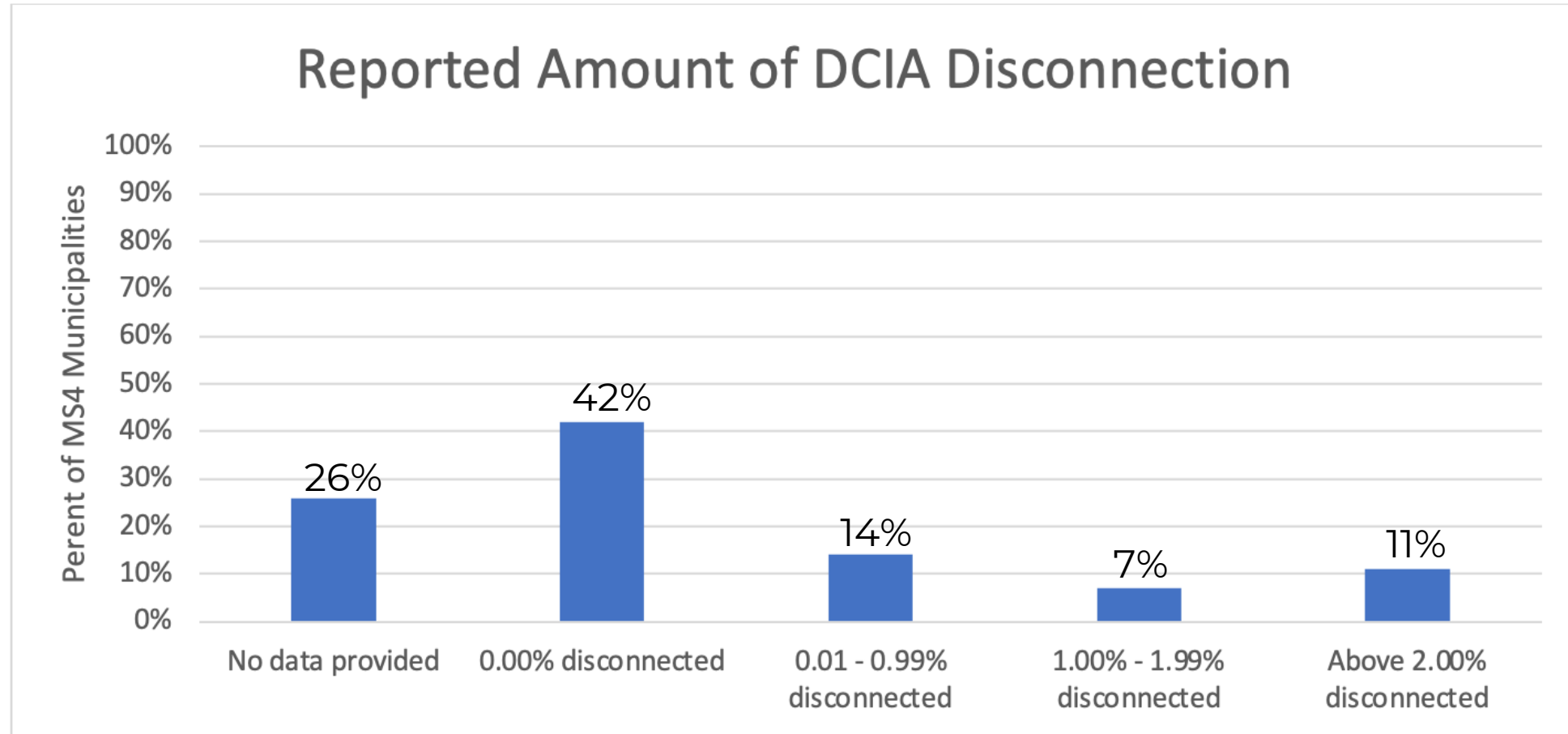
# MS4 Compliance – Dry Weather Screening



# MS4 Compliance – Outfall Monitoring



# MS4 Compliance – DCIA Disconnection





# Is my town too big or too small?

*Reported data from  
all towns (89/121)*

- Average baseline DCIA:  
**1,102 acres**
- 69% towns BELOW average
- 31% towns ABOVE average
- Range of 5 acres to 7,907 acres

*Data from towns that  
have hit at least 1%*

- Average baseline DCIA:  
**1,165 acres**
- 71% towns BELOW average
- 29% towns ABOVE average
- Range of 7 acres to 7,104 acres

# What has made a difference?

## 2012 Lookback:

- **Glastonbury:** 3.6% since 2012

- 2012 – 2017: 20.7 acres
- 2018 – 2022: 10.5 acres

- **Cromwell:** 4.9% since 2012

- Large roadway and drainage reconstruction project in 2016:
  - Disconnected 15.6 acres / 319 acres

DCIA disconnected (approved projects)  
Total to Date = 36.14 acres  
2023- 4.99 acres  
2022 – 1.25 acres  
2021 - 3.71 acres  
2020 –0.96 acres  
2019 – 3.64 acres  
2018 – 0.94 acres  
2017 – 9.41 acres  
2016 – 0.00 acres  
2015 to 2011 – 11.24 acres

# What has made a difference?

- Stormwater Corps:

- **Completed:** Branford - 1.97%
  - 3,270 sq. ft. Rain Garden at Foote Park
- **Potential:** City of Groton - 4.25%
  - Overall reduction of 21,477 sq. ft. of impervious cover
    - Rain gardens, bioretention systems, tree box filters
  - Funding to prioritize projects



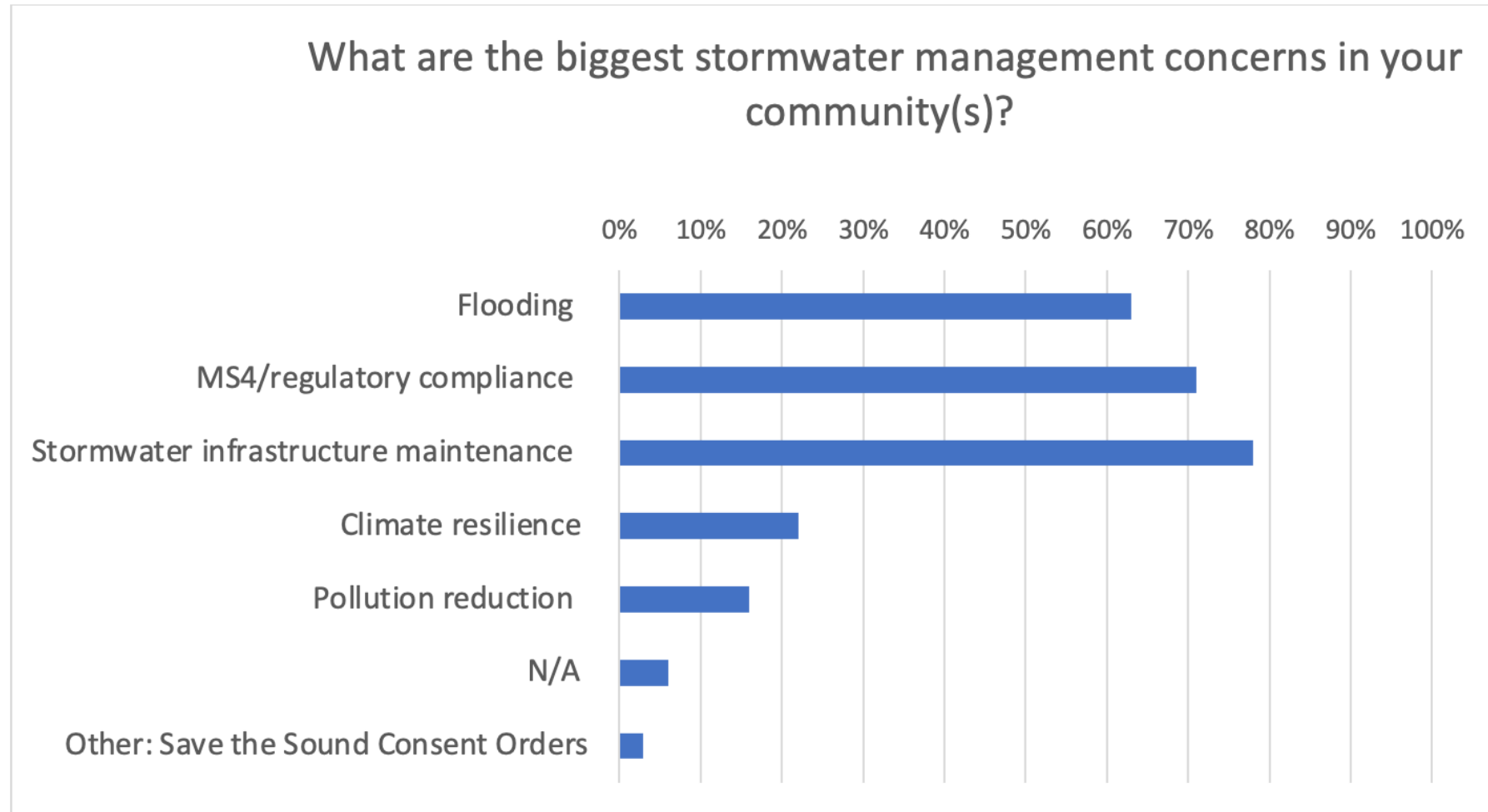


# MS4 Compliance

As of 2021:

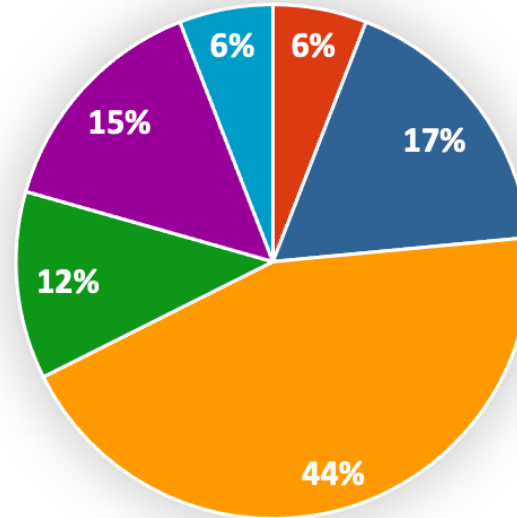
- 77%: Have updated land use regulations
- 83%: Have completed formal employee training
- 49%: Have completed control of other sources of pollutants to MS4
- 52%: Have completed additional measures for impaired waters
- 82%: Have completed infrastructure rehab and repair program
- 83%: Have begun their impaired waters monitoring

# MS4 Survey



# MS4 Survey

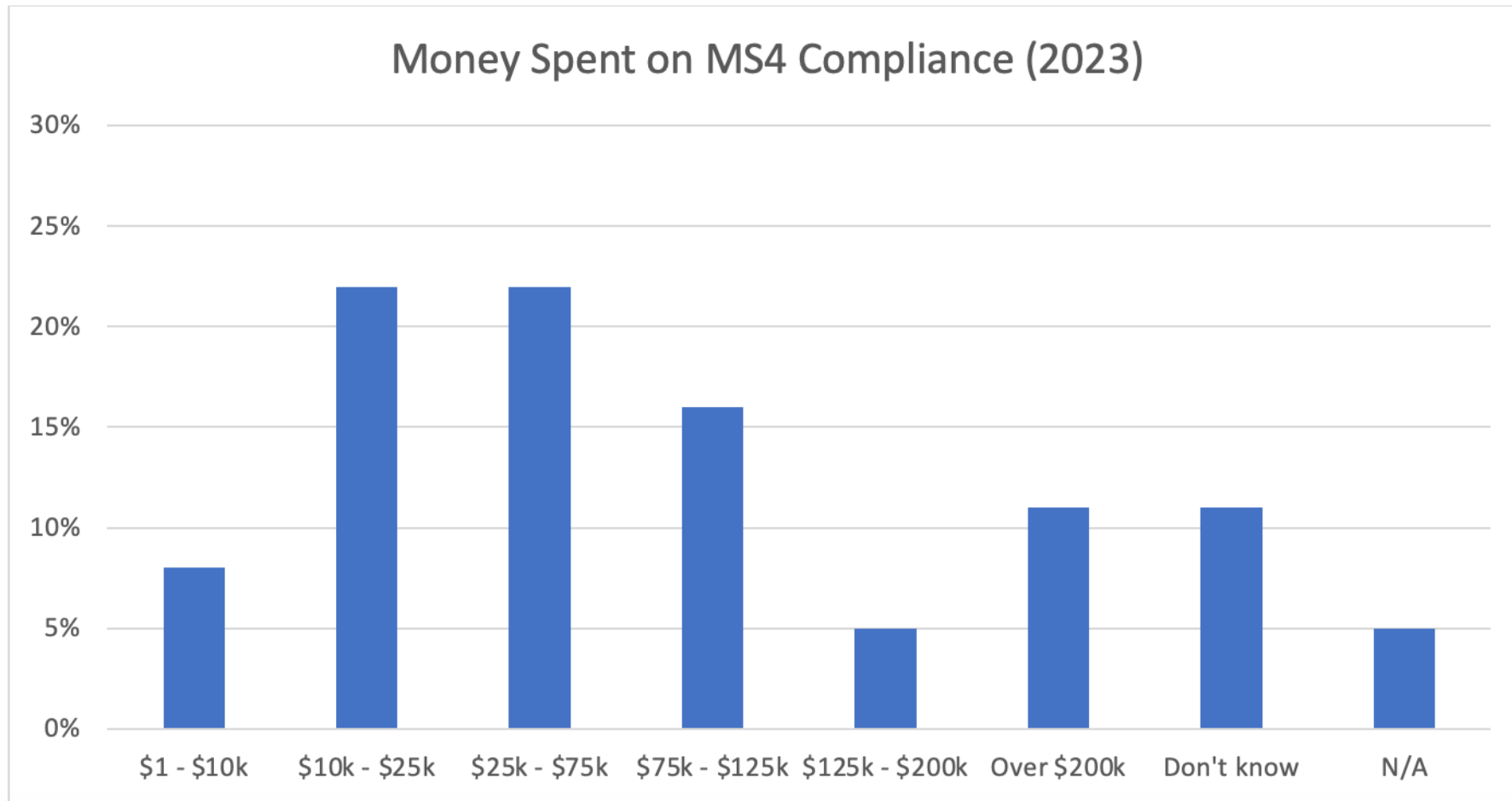
What area of MS4 compliance has been most costly for your community?



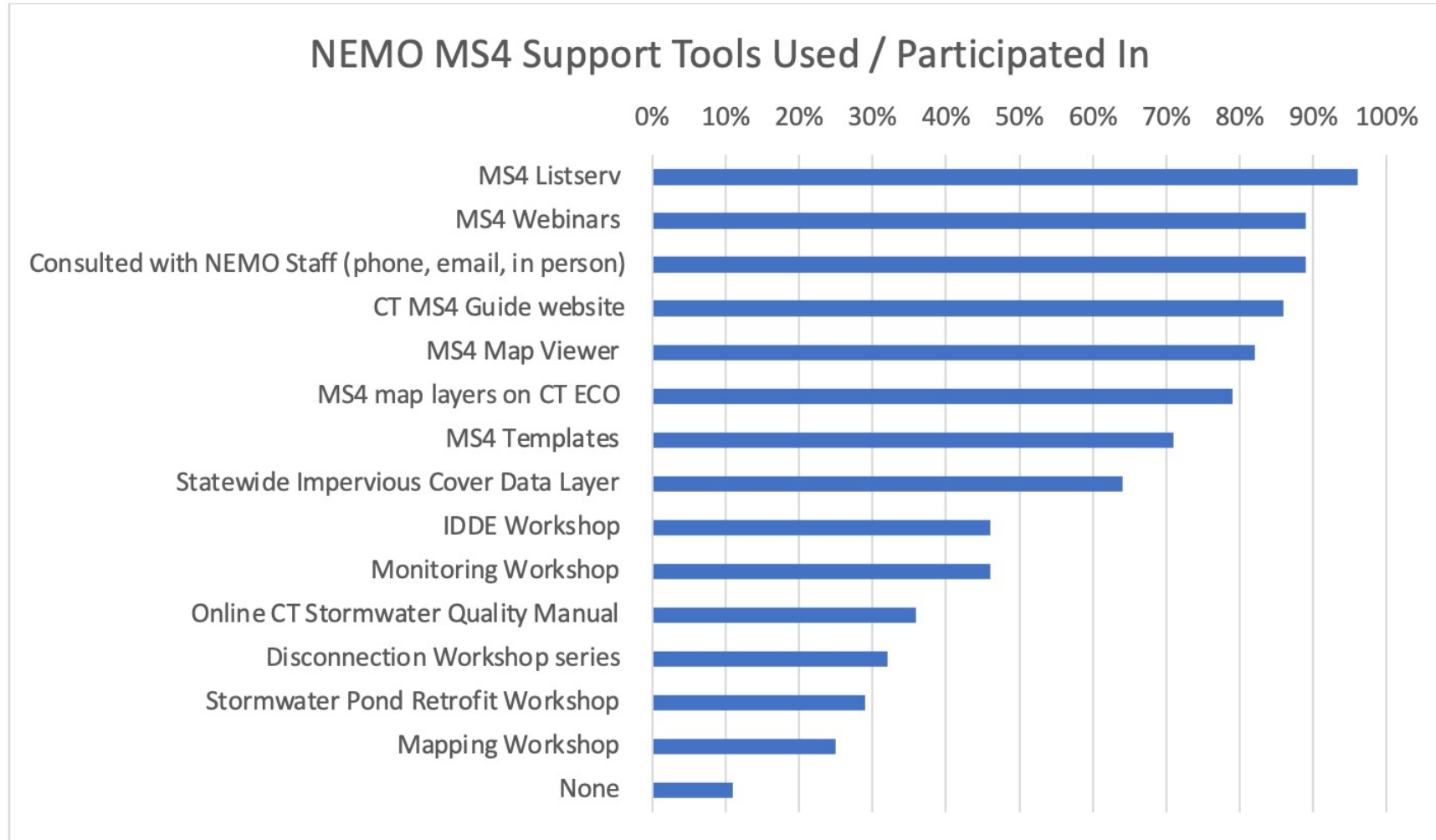
- Flooding mitigation / recovery
- Impervious area disconnection retrofits
- Street Sweeping / catch basin cleaning
- Infrastructure repair
- IDDE implementation / investigation
- Impaired water quality monitoring



# MS4 Survey



# MS4 Survey







# DEEP Thoughts

. . .







# TAKE-AWAYS & OPPORTUNITIES

STORMWATER QUALITY MANUAL AND CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL

Presented by: Kathleen Knight, Long Island Sound Project Coordinator  
Bureau of Water Protection and Land Reuse



# OBSERVATIONS DURING AND AFTER DRAFTING



Capacity and funding limitations in general,



Interest in LID for its climate relevancy and other benefits,



Maintenance guidance needed,



Retrofits can be complex. State-state nuances made it more complex,



Climate has greater impacts than just pollution alone & is evolving situation and,



Approach of TSS only was concern that it was missing purpose.

# APPROACH OF MANUAL FOR PROGRESS



Capacity and funding limitations in general,



Interest in LID for its climate relevancy and other benefits,



Approach of TSS only was concern that it was missing purpose.

Manual's new format provides functional guidance & allows for use of EPA's curves for best management practice selection. This enables:

1. Enhanced capacity with regionally consistent curves,
2. Designs to address site specific needs,
3. Enable solutions that are lower in maintenance needs and,
4. Enable co-benefits that can alleviate (not necessary fix) other site issues.

Manual was updated in parallel with Guideline on Soil Erosion and Sediment Control. This approach enables:

1. Holistic site planning from construction to final design.

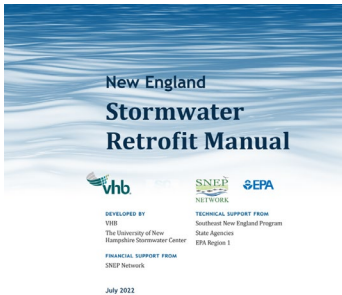
# APPROACH OF MANUAL FOR PROGRESS



Capacity and funding limitations in general,



Retrofits can be complex. State – state nuances made it more complex and,



Leverage parallel development of the regional retrofit manual.

Including by reference enables:

1. Increased capacity with regional consistency and
2. Opens the door for partial crediting.

# APPROACH OF MANUAL FOR PROGRESS



Capacity and funding limitations in general,



Interest in LID for its climate relevancy and other benefits,



Maintenance guidance needed,



Climate has greater impacts than just pollution alone & is evolving situation

Revised planting guidance based on function & direct reference to USDA resources. This enables:

1. Flexibility under evolving climatic conditions,
2. Principals provided guide designers to lower maintenance practices opening capacity.



# APPROACH OF MANUAL FOR PROGRESS



Capacity and funding limitations in general,



Interest in LID for its climate relevancy and other benefits,



Climate has greater impacts than just pollution alone & is evolving situation

Climate related values updated to refer to NOAA data. Appendix added to suggest considerations for further climate considerations (and provide clarity for decisions within the manual). This enables:

1. Parallel planning and opportunities to achieve co-benefits.

Note: The Stormwater Quality Manual nor the Guidelines on Soil Erosion and Sediment Control are not a climate or flooding manual. They are guidance for addressing pollution-based programs.

# APPROACH OF MANUAL FOR PROGRESS



Capacity and funding limitations in general,



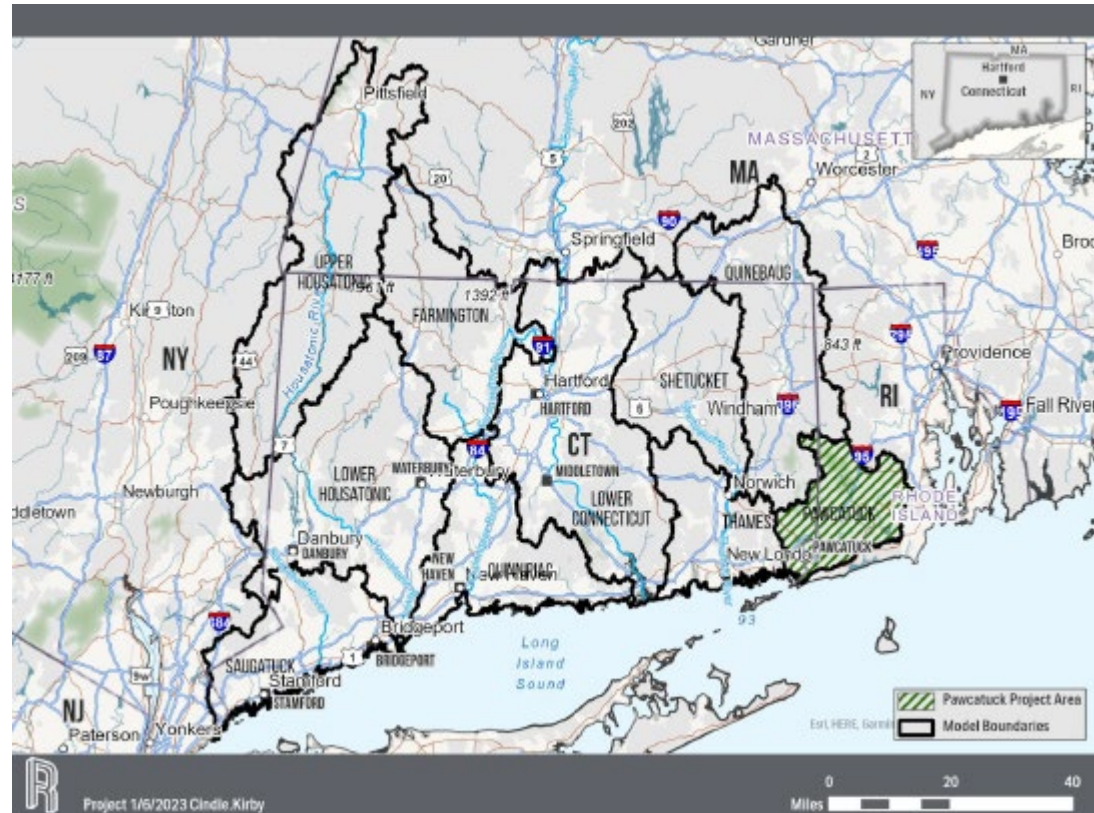
Maintenance guidance needed,

Maintenance Checklist Appendix provided with focus on function and common aspects to inspect. This enables:

1. Holistic site maintenance,
2. Adaptable guidance for site specific needs.

# OPPORTUNITIES TO TRACK

Connecticut is in progress of watershed model that will provide a scenario builder that includes cost considerations.

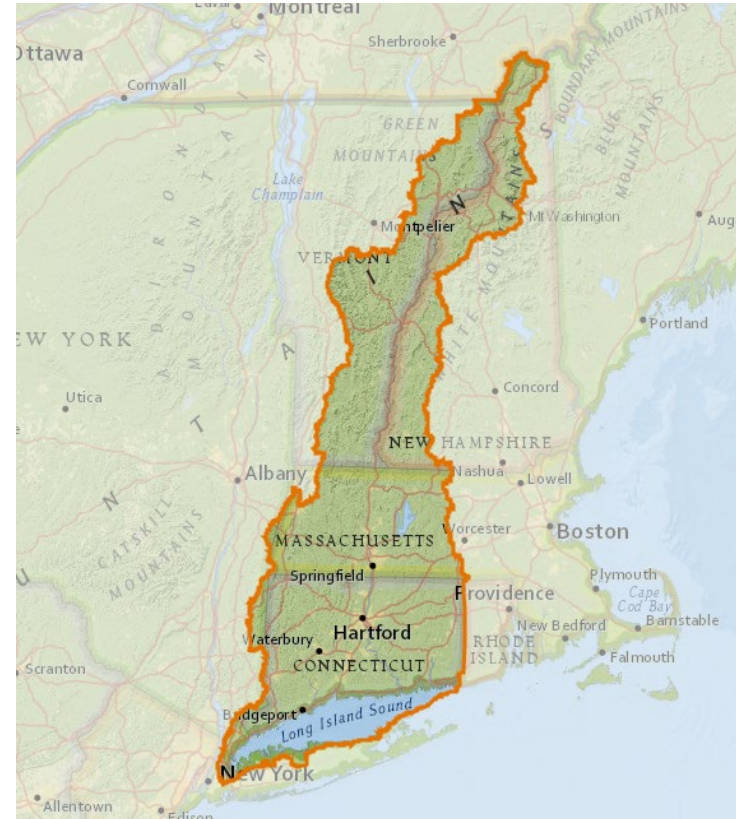


# OPPORTUNITIES TO TRACK

Connecticut is in progress of watershed model that will provide a scenario builder that includes cost considerations.

USGS and EPA Region 1 are coordinating on model that includes cost for the region.

*Note: Both of these utilize EPA region 1 BMP curves for evaluating reductions.*





# OPPORTUNITIES TO TRACK

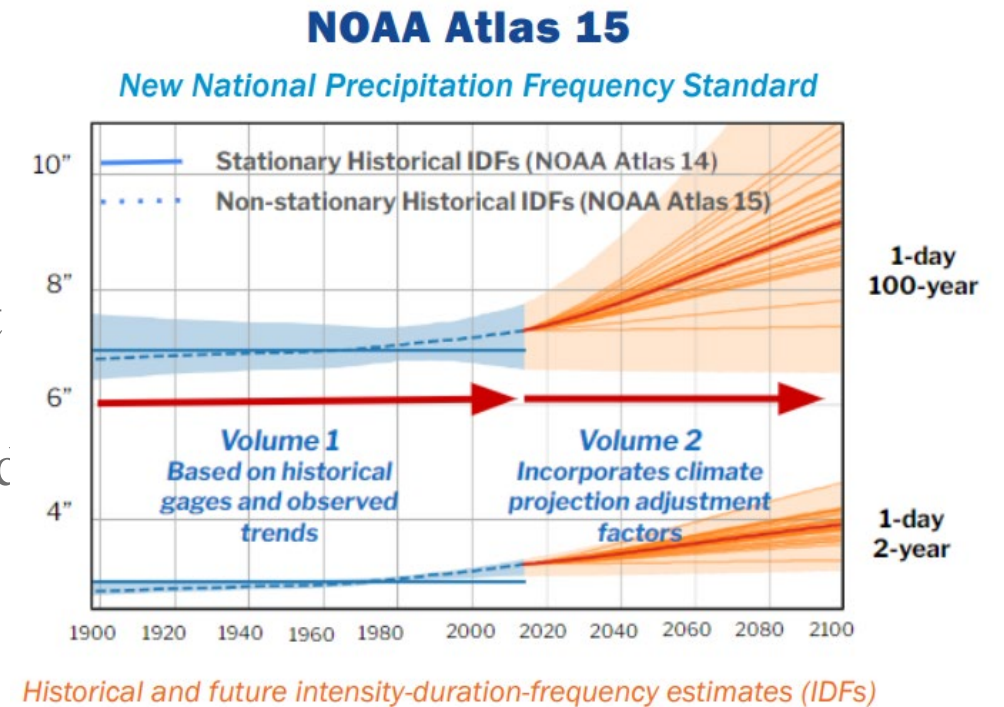
Connecticut is in progress of watershed model t that includes cost considerations.

USGS and EPA Region 1 are coordinating on moc region.

*Note: Both of these utilize EPA region 1 BMP curves for evaluating reductions.*

NOAA has indicated that Atlas 15 may not only provide traditional data update but may also include an option for climate projections.

Note these opportunities may not necessarily be appropriate for Stormwater Quality Manual or the permit programs it supports. But they are potential opportunities to evaluate to bridge the current work to further the solutions we are hearing the communities are looking for.







# MS4 LISTENING SESSION TAKE-AWAYS

## MS4 PROGRAM

**Presented by: Chris Stone, Environmental Engineer III & Nicole Kibbe, Environmental Engineer I**  
**Water Permitting and Enforcement Division (WPED), Stormwater Program**

# MS4 LISTENING SESSION

## DEEP hosted a Listening Session January 25, 2024

Purpose: solicit feedback from the regulated community on the conditions of the current permit.

- ⊃ Thank you for coming!
- ⊃ The window for submitting additional comments closed last Saturday.
- ⊃ All feedback will be considered as we work toward modifying the existing permit.

Many of the comments received concerned the end of funding for our partnership with UCONN CLEAR, which has provided valuable support and resources to the regulated community.

- ⊃ DEEP is evaluating options to continue providing compliance support.

**60+ in attendance  
representing:**

Municipalities

Municipal  
Organizations

Environmental  
Organizations

Councils of  
Government

Consultants



# MS4 LISTENING SESSION

## *COMMENTS RECEIVED*

We received comments from participants on a number of topics:

Public Education

DCIA Problems &  
Benefits

Road Maintenance  
Problems & Benefits

IDDE Sampling  
Problems & Benefits

Legal Authority  
Problems

Procurement of  
Technical Expertise

Budget Constraints

Annual Reporting  
Requirements

**Comments ranged from positive to negative, often on the same topic.**

DEEP will consider all comments when drafting modifications.



# MS4 LISTENING SESSION

## *SUGGESTIONS RECEIVED*

DEEP also received a number of suggestions from participants:

Provide more tools and  
training for permittee use

Develop a DCIA tracking  
sheet for developers

Tiered Compliance Program

Statewide program for  
stormwater education

Statewide Stormwater  
Coalition

Compliance Certification  
Process

**There seemed to be a lot of interest in some of these suggestions.**

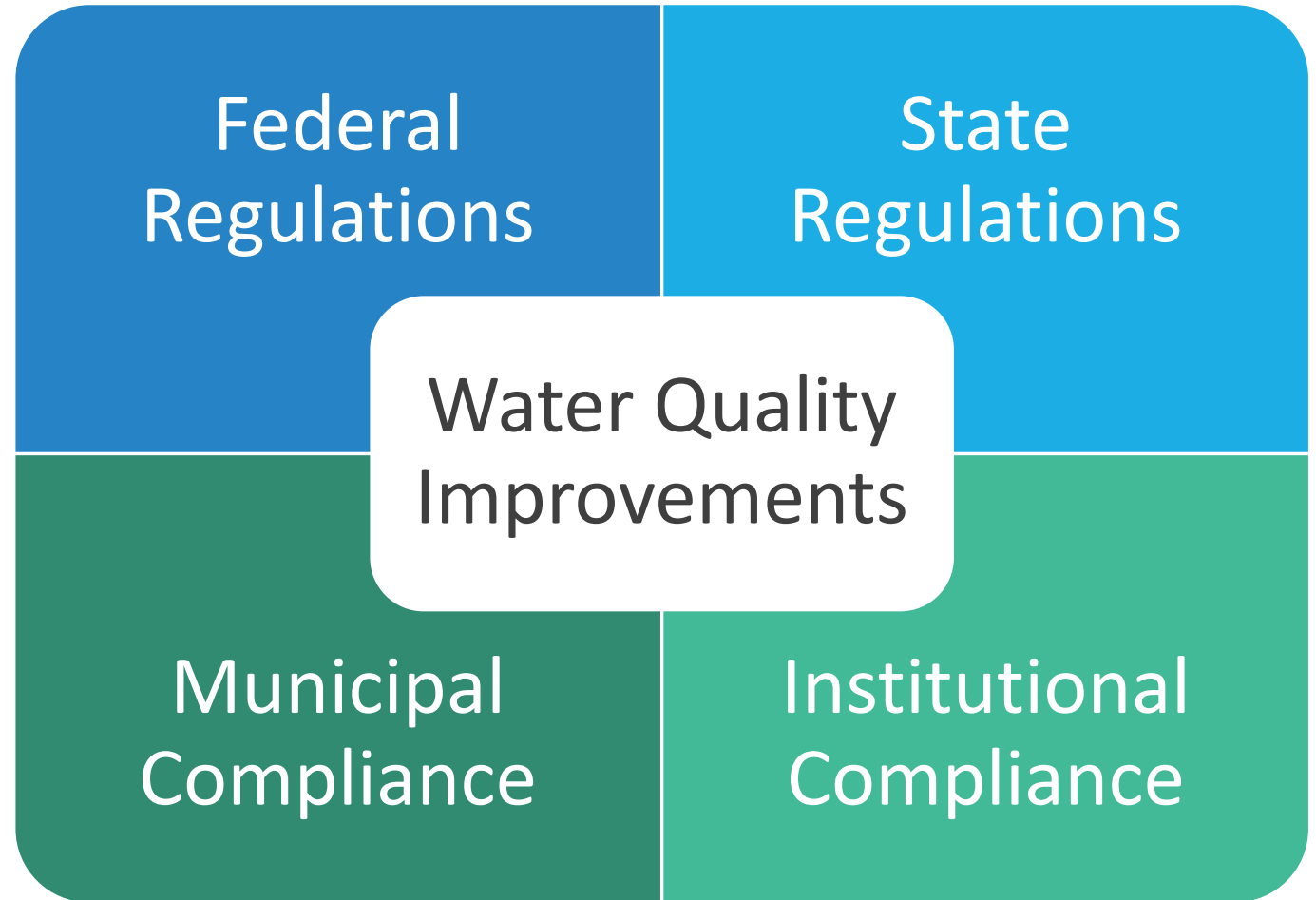
DEEP will consider all suggestions while drafting modifications.

# MS4 LISTENING SESSION

## REGULATORY FRAMEWORK

**DEEP permits must be in compliance with state and federal regulations.**

DEEP may add on to these requirements to better protect the environment and adjust requirements to account for potential compliance issues.



# MS4 LISTENING SESSION

## MAIN TAKE-AWAY

### BROADEN OUR VIEW!

*Focus on the goal of the program – the protection of water quality.*

Every measure included in the permit is meant to promote and protect water quality.

★ *What can we do to make compliance more achievable without compromising this goal?*

- ≧ Can measures be adjusted? To what extent?
- ≧ Can reporting and record-keeping measures be streamlined?
- ≧ Are there substitutions that can be made that achieve the same (or better) protection?
- ≧ How much compliance assistance is needed? How much can we provide?

DEEP will be looking into these questions as we draft permit modifications.

# MS4 LISTENING SESSION

## REISSUANCE PROCESS NEXT STEPS

### Technical Workgroup

While we work on modifications, DEEP will also host a technical workgroup for interested parties.

- ⊃ Participants will be asked to provide commentary and suggestions for potential changes to the permit, prior to the public comment period.
- ⊃ Interested parties can email [Nicole.Kibbe@ct.gov](mailto:Nicole.Kibbe@ct.gov) to join the notification list.

### Draft modifications to the current Small MS4 General Permit

Modifications will consider comments received.

Reissuance Timeline:

- ⊃ Draft modifications will be posted for public comment. **TARGET: September 2024**
- ⊃ Permit will be reissued with modifications. **TARGET: December 2024**





# TAKE-AWAYS & OPPORTUNITIES

STORMWATER QUALITY MANUAL AND CONNECTICUT GUIDELINES FOR SOIL EROSION  
AND SEDIMENT CONTROL

**Presented by: Kathleen Knight, Long Island Sound Project Coordinator**  
**Bureau of Water Protection and Land Reuse**



# OTHER RESOURCES

## District Collaborations:

For Example:

Southwest Conservation District offers:

1. peer review and recommendations for development proposals,
2. conduct bacteria monitoring, can provide outreach and educational materials and,
3. can assist with planning and concept designs for sediment erosion controls.

..in New Haven and Fairfield Counties.

[SWCD@conservect.org](mailto:SWCD@conservect.org)

## Local Watershed Nonprofits:

For Example: Harbor Watch has the capabilities to conduct dry-weather outfall screening and IDDE sampling. We have an in-house state-certified laboratory to process the bacteria samples we collect. Inquiries can be directed to [harborwatch@earthplace.org](mailto:harborwatch@earthplace.org).

# WHERE ARE WE NOW

Long Island Sound Study was able to provide Stormwater Education Grant to support the new Guidance, this grant has now come to close.

Stormwater team is seeking opportunities to continue this collaboration with NEMO team in a long-term sustainable way but has yet to identify a solution.

# Town of North Branford Engineering Department



## Stormwater Disconnect Past Experiences and Opportunities

# Connecticut's Conservation Districts

- **CT Association of Conservation Districts**
  - Local non-profit organizations that serve municipalities & residents
  - Provide technical services & education
  - There are 5 districts across the state
  - Watershed Management program work with DEEP and EPA to fund projects
  - Projects funded in part by Section 319 of the Federal Clean Water Act
- **Eastern CT Conservation District (ECCD)**
  - Coordinated design & funding of smaller projects with ECCD
  - Projects included tree filters, rain gardens, and small-scale infiltration projects (First Flush)
  - Public Outreach included educational components for fertilizer use, dog waste, and septic systems
  - A Watershed Plan, when applicable, increased funding success through Grant cycles



# Farm River Watershed Management Plan

prepared by  FUSS & O'NEILL

AUGUST 2021





# Farm River Watershed Management Plan

- **The Farm River Watershed**
  - Located in New Haven and Middlesex Counties in South Central CT
  - Covers an area of approximately 25.5 square miles
  - 6 Towns: Durham, Wallingford, North Branford, North Haven, Branford, and East Haven
- **Completion of the Watershed Management Plan**
  - Improves the overall health of the watershed
  - Provides opportunities for funding through several programs and grants
  - Impervious cover analysis referenced within the Plan – Participate in the Planning Process
  - Recommends BMP's at various sites through out the watershed to reduce the amount of stormwater runoff from entering streams



Colony Road Tree Filters

Impervious Cover  
Disconnect 0.7 Acres



## Grand Street Area Tree Wells

Impervious Cover  
Disconnect 4.3 Acres





## East Lyme High School Parking Lot Infiltration

Impervious Cover  
Disconnect 1.0 Acre





East Lyme High School Raingarden

Impervious Cover  
Disconnect 0.4 Acres

# *Rain Garden*

## *Operation & Maintenance Plan*



(image - [www.groundworkhv.org](http://www.groundworkhv.org))

Prepared by:  
Eastern Connecticut Conservation District  
238 West Town Street,  
Norwich, CT 06363  
860-319-8806

For:  
East Lyme Public Schools  
Facilities Department  
165 Boston Post Road  
East Lyme, CT

July 24, 2018

I certify that ECCD staff have reviewed this  
Operations & Maintenance Plan with the  
East Lyme High School Facilities  
Supervisor and have provided a copy of the  
Plan for use.

---

ECCD

---

Signature of project participant.



# Town of North Branford – MS4 Employee Training

- **Section 6. Development of Stormwater Management Plan**

- 6(a)(6)(A) Minimum Control Measures – Pollution Prevention Good Housekeeping
- The permittee shall implement an operations and maintenance program
- Formal employee training program (Slide Show & Video)
- General goals & objectives of the Plan, illicit discharges, spill response protocols, in addition to standard operating procedures for key personnel

- **Operation & Maintenance Program**

- Stormwater system maintenance & inspections; cleaning catch basins, cleaning stormwater treatment BMP's, tree filter maintenance & inspections, and channel & culvert inspections
- Stormwater BMP's: Municipal Stormwater Drainage System Maintenance

(Two Page Written Document – DPW)

## STORMWATER BMPs: MUNICIPAL STORM DRAINAGE SYSTEM MAINTENANCE

### AFFECTED FACILITIES

This BMP applies at all municipal storm drainage structures. This includes storm drain inlets, catch basins, sumps, storm sewer lines, manholes, drainage ditches, structural BMPs, outfalls and detention areas.

### BACKGROUND

As a consequence of its function, the storm water conveyance system collects and transports urban runoff and snowmelt that may contain certain pollutants. Any pollutant that might wind up on a street or parking lot can wind up in the storm drain. This may include oil and grease, nutrients, trash, organics and oxygen depleting compounds. Maintaining catch basins, storm water inlets and other storm water conveyance structures on a regular basis will remove pollutants, prevent clogging of the downstream conveyance system, restore catch basin's sediment trapping capability and ensure the system functions properly to avoid flooding.

### BEST MANAGEMENT PRACTICES

- Develop a schedule for inspection and cleaning of the municipal storm drain system including detention ponds and permanent BMPs.
- Inspect the municipal storm drain system for cracks, leaks and other conditions that would lead to breakdowns in the system *at least yearly*.
- Repair any storm sewer found to be leaking, clogged or damaged as soon as possible.
- Clean out storm sewers according to a pre-determined schedule with maximum activity preferable in late winter and early spring. If there are certain runs that are prone to fast sediment build-up such as runs without sufficient slope, schedule them more frequently.
- When flushing or jetting inlets or ditches, use Vactor truck to vacuum up wastewater downstream.
- Report any suspected illegal connections or dumping to the Town storm water coordinator.
- Do not discharge any contaminated stormwater or storm sewer flush water into surface waters. (Contaminated wastewater must be disposed at an approved disposal facility depending on the type and concentration of contaminants.)
- Ensure that debris from vac trucks is collected and taken to a secure temporary storage area or directly to its permanent disposal site. The storage area should be more than 100 feet from and at a lower elevation than any water body, creek, river, ditch or storm drain inlet. Ensure that any temporary storage areas for debris are protected from wind or rain re-entrainment.
- Disposal of debris should be done on a regular basis and debris should not be allowed to accumulate.
  - If temporary storage is required before pick-up, store wastes in containers (dumpsters or dump trucks) or on a paved, bermed area with containment berms.
  - Store debris at least 100 feet from or at a lower elevation than any storm drain inlets or ditches.
- Do not empty Vactor trucks near storm drains or surface water bodies or where wind or rain could re-entrain or scatter the debris.
- Periodically sample the collected sediments to determine if they can be disposed in a sanitary landfill.

- If oil, antifreeze or other hazardous wastes are discovered in any catch basins, the wastes removed may be hazardous or require special disposal. Dispose of contaminated debris properly.

### REQUIRED STRUCTURES AND EQUIPMENT

- Stencil, mark or place decals or medallions on all storm drain inlets with warnings not to dispose of any materials or wastes. (LONG TERM GOAL)

### INSTALLATIONS REQUIRED FOR NEW CONSTRUCTION OR RENOVATIONS

- Grade and size all new storm sewers and drainage ditches for optimal channel hydraulics.
- When upgrading or modifying an existing storm sewer, check for illegal connections or dumping: staining, discoloration, unusual odors, or connections from unknown origins. Report all such discharges to the Town storm water coordinator.
- Install swales and filter strips in drainage ditches to act as a bio-filter.

### REQUIRED EMPLOYEE AND CONTRACTOR TRAINING

- Train all current employees who perform maintenance or cleaning of storm drainage systems on this BMP. Include training on the required bookkeeping associated with this BMP.
- Train all new hires and job transferees who will perform maintenance or cleaning of storm drainage systems on this BMP.
- Conduct refresher training on this BMP for all employees who perform maintenance or cleaning of storm drainage systems as needed.
- All contracts should stipulate that contracted employees are trained in stormwater pollution prevention BMPs.
- Train employees who perform maintenance, cleaning, modifications, or new system installation on how to recognize and report illegal connections or dumping.

### REQUIRED MAINTENANCE

- Inspect and repair or replace any defective drain inlets, catch basins, catch basin lids, sumps, clean-out grates and outfall grates.
- Where signs of erosion or cracking of concrete are noted in drainage ditches, make appropriate modifications: re-seeding, re-grading, diversion, repairing etc.
- Maintain and replace faded, damaged or missing stencils, markings, decals or medallions on drain inlets.
- Mow drainage ditches and swales periodically. Vegetation can be left long unless it restricts flow or causes backing-up. During mowing, inspect ditches for signs of erosion.

### RECORDS

- Keep accurate records of the number of sumps and catch basins cleaned and where these inlets are located.
- Record the amount of waste collected and disposed of.
- Keep a schedule of storm drain cleaning. Schedule inlet or catch basin cleaning based on priority areas and/or time of the year.
- Keep records of employee and contractor trainings.
- Keep records of repairs and maintenance performed on storm drainage systems.





East Lyme High School Raingarden

Impervious Cover  
Disconnect 0.4 Acres

# Contact Information

- **Victor Benni, PE**
- North Branford Town Engineer
- 203-484-6009
- [vbenni@northbranfordct.gov](mailto:vbenni@northbranfordct.gov)



**Moving  
forward -  
resources to  
help**





# NEMO's MS4 Support

Funded by DEEP penalty & grant money for 8 years

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

**Funding ends 3/31/2024**



Mary Looney



CTMS4-L Home Page

CTMS4-L@LISTSERV.UCONN.EDU

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Re: MS4 website and stormwater management plan template now available

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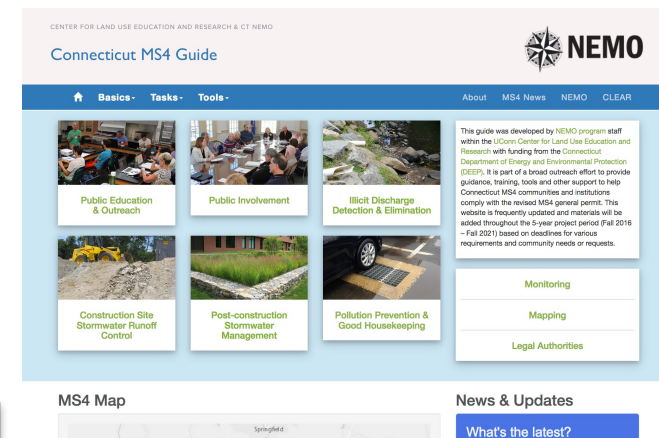
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- February 2017
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- December 2016
- November 2016
- October 2016

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



maps & data



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



workshops & webinars



# MS4 Online Guide

MS4 Home

Basics ▾

Tasks ▾

Tools ▾

About MS4 ▾



**Public Education and Outreach**



**Public Involvement and Participation**



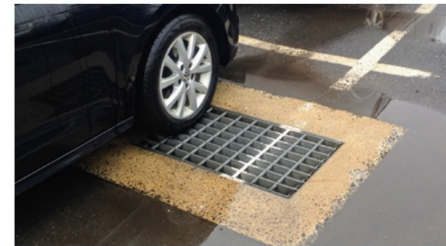
**Illicit Discharge Detection and Elimination**



**Construction Site Stormwater Runoff Control**



**Post-construction Stormwater Management**



**Pollution Prevention and Good Housekeeping**

MONITORING

MAPPING

LEGAL AUTHORITIES

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

# MS4 Workshop Archive


- Stormwater pond retrofits
- IC Disconnection
- IDDE
- WQ Monitoring
- MS4 Mapping

Stormwater Pond Retrofit Workshop Materials
+

CT MS4 December Disconnection Workshop Materials
x

## CT MS4 December Disconnection Workshop Materials

The NEMO program presented a virtual workshop series on the impervious cover disconnection portions of the MS4 Permit during December 2020. The presentation slides and recordings can be found below.




### Summary of LID provisions in CT's MS4 permit

**December 1st, 2020**  
Presented by: Amanda Ryan, UConn CLEAR

UConn CLEAR's Amanda Ryan presents on the requirements in the CT MS4 General Permit to review and amend local land use regulations to encourage the use of LID. Presented on Dec 2, 2020 as part of the December Disconnection Workshop Series.

VIEW PRESENTATION
VIEW SLIDES



### Assessing barriers to LID in local regulations

**December 2nd, 2020**  
Presented by: Aaron Budris, NVCOG

Aaron Budris, Senior Planner with the Naugatuck Valley Council of Governments (NVCOG), presented on a project that reviewed the regulations of their member towns and made recommendations for how they could promote the use of LID. Presented on Dec. 2, 2020 as part of the December Disconnection Workshop Series.

VIEW PRESENTATION
VIEW SLIDES

<https://nemo.uconn.edu/ms4/tools/workshops/>

# LID & Disconnection

## Low Impact Development

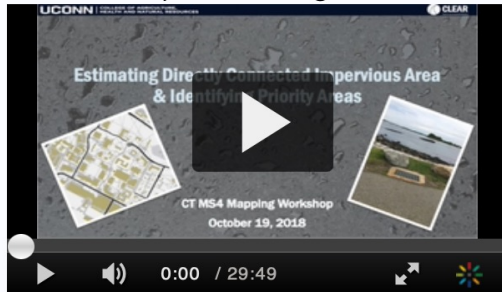
## Directly Connected Impervious Area (DCIA)

### Tracking DCIA

- [DCIA tracking spreadsheet](#) developed by CT NEMO long ago.

### DCIA tutorial

This video explains all things DCIA in the MS4 permit:



<https://nemo.uconn.edu/ms4/tasks/post-construction/>

Stormwater ▾

Green Stormwater Infrastructure ▾

Projects ▾

About NEMO ▾

UConn CLEAR

## Resources

### Low Impact Development

#### Tools for reviewing and updating municipal regulations

- [Developing a Sustainable Community](#) by CT NEMO. An easy to use guide to help Connecticut communities craft plans and regulations that promote Low Impact Development and protect water quality.
- [LID Site Planning and Design Techniques: Municipal Self assessment](#) by RI NEMO. A comprehensive step-by-step guide for reviewing municipal regulations
- [Code and Ordinance Worksheet \(COW\)](#) by the Center for Watershed Protection. A tool to help communities evaluate their local development regulations to identify revisions that allow (or require) site developers to minimize impervious cover, conserve natural areas and use runoff reduction practices to manage stormwater runoff.

#### Tools for reviewing site plans

- [CT NEMO sample LID checklist](#) for site plans.
- [Town of Vernon LID checklist](#) for review of development applications to the Planning & Zoning Department.

#### LID Design templates

- [Tree well designs](#) from the Town of East Lyme.
- [15'x 5' Bioswale design](#) from the City of New Haven.
- [Bioswale cross section](#) from the City of New Haven.
- CT NEMO's [Rain Garden App](#) and [website](#).

#### Tools for Maintaining LID

- [Stormwater wet pond and wetland management guidebook](#) provides detailed guidance on how to maintain stormwater ponds.
- [In the Weeds: A Guide for Maintaining Vegetation in Stormwater Treatment Systems in Rhode Island](#) developed by the University of Rhode Island. They also created an app version of this guide which you can get [here](#).
- [Long-term Maintenance Plan for LID Installations on Town Property](#) from the Town of Mansfield.



# Disconnection - Stormwater Corps

- The Stormwater Corps program combines classroom instruction on stormwater management with projects in the community
- Team of students will identify, assess, and recommend **opportunities to retrofit traditional stormwater control measures with low impact development/nature-based approaches**





# Disconnection - Stormwater Corps

= Projects completed during the Academic Year (Fall) Practicum
  = Projects completed during the Summer Corps

<b>Bloomfield</b> 	<b>Bolton</b> 	<b>Branford</b> 	<b>Cheshire</b> 
<b>Clinton</b> 	<b>Coventry</b> 	<b>Cromwell</b> 	<b>Deep River</b> 
<b>East Hartford</b> 	<b>Guilford</b> 	<b>City of Groton</b> 	<b>Town of Groton</b> 
<b>Hamden</b> 	<b>Hebron</b> 	<b>Madison</b> 	<b>Manchester</b> 

## Bloomfield

[Stormwater Corps](#)
[Students](#)
[Communities](#)
[Town Projects](#)
[Faculty](#)
[FAQs](#)

### Project Team

**Date:** Fall 2021  
**UConn Students:** Benjamin Gardiner, Emma Morgan  
**UConn CLEAR:** David Dickson, Michael Dietz

### The Runoff Reduction Report

This **report** includes recommendations for green stormwater infrastructure practices at 5 sites in the town of Bloomfield. Each site is displayed with an ArcGIS map of the recommended practice, detailed description of our recommendations, and an informational table. Each table shows an estimated drainage area, our recommended green infrastructure, annual gallons of runoff treated, nitrogen and phosphorus pollution reduction amounts, and the suggested size of each practice. These estimations were calculated based on the drainage area, annual rainfall estimates specific to Connecticut, and literature export values.

### Report

Runoff Reduction Recommendations  
 for the **Town of Bloomfield** - Fall 2021

University of Connecticut  
 Stormwater Corps  
<https://sepcorp.institute.uconn.edu>  
 Benjamin  
 Gardiner  
 Environmental  
 Science 2022  
 Emma Morgan  
 Environmental  
 Science 2022



READ REPORT

### GSI Summary Table

The following calculations display the potential pollutant-reducing benefits if the practices identified within the report were implemented:

Site	Location	GSI Suggestion	Drainage Area (sq. ft.)	Annual Gallons Treated	Annual Nitrogen Reduction (lb. N/yr)	Annual Phosphorous Reduction (lb. P/yr)	Suggested Practice Size [6 in. depth] (sq. ft.)
1	Town Hall	Rain Garden 1	3,200	84,870	0.88	0.11	535
		Rain Garden 2	2,395	63,080	0.66	0.08	400

<https://nemo.uconn.edu/stormwater-corps/>

# Staff Training

[Stormwater](#)
[Green Stormwater Infrastructure](#)
[Projects](#)
[About NEMO](#)

[MS4 Guide](#) / [MS4 Tools Overview](#) / Training Materials

## Training Materials

[MS4 Home](#)
[Basics](#)
[Tasks](#)
[Tools](#)
[About MS4](#)

Each year towns must train their staff on:

#	Training topic	Example material
1	Water quality issues and managing municipal stormwater	<a href="#">Why regulate stormwater?</a>
2	The goals and objectives of their Stormwater Management Plan	<a href="#">Connecticut's MS4 Permit: What's New?</a> webinar
3	Good-housekeeping Standard Operating Procedures (SOPs) covering how the town: Uses fertilizer on parks and open space Manages pet waste Manages waterfowl Manages fall leaves Prevents stormwater pollution from buildings and facilities Maintains and stores vehicles and equipment Applies and stores deicing material	<a href="#">CRMSWC video:SWPPPs at Municipal Maintenance Facilities</a>  Minnesota MS4 Tool Kit: <a href="#">Fertilizers and Pesticides</a> <a href="#">Vehicle Maintenance</a> <a href="#">Road Maintenance</a> <a href="#">Cleaning of Maintenance Equipment, Building Exteriors, and Dumpsters</a> <a href="#">Right of Way Maintenance</a>

<https://nemo.uconn.edu/ms4/tools/training-materials/>

# UConn CLEAR Rain Garden Certificate Course



- **Description:** This course designed to provide guidance on how to properly site, size, install, and maintain rain gardens.
- **Who should take this course:** landscapers, contractors, public works directors & staff, others interested in rain garden design, installation and maintenance
- **Format:** Online, at your own pace. 7 modules with module quizzes and final course exam.
- **Estimated time to complete:** 4-6 hours
- **Cost:** Free



# Other LID/GSI Training Programs

## Washington Stormwater Center



- Online courses in LID
- Design Certificate (\$150)
- Operations and Maintenance Certificate (\$100)

<https://www.wastormwatercenter.org/low-impact-development/lid-training-programs/>

## NJ Green Infrastructure Champion Training



- Weekly webinars
- GSI planning and implementation
- Technical support to develop a design
- Free!

<http://water.rutgers.edu/Projects/GreenInfrastructureChampions/GIC.html>



# Finding the SWQ Manual

Download from DEEP website:

<https://portal.ct.gov/DEEP/Water-Regulating-and-Discharges/Stormwater/Stormwater-Manual>

NEMO website

- Broken down by chapter
- Breakdown of revisions
- Webinars archive

[ctstormwatermanual.nemo.uconn.edu](https://ctstormwatermanual.nemo.uconn.edu)

## Overview and Breakdown of Chapters

This page provides general information on the purpose of each chapter, the summary of revisions made from the 2004 Manual, and when this chapter is applicable for usage. Click on a chapter for a drop down of this information as well as a link to a page for each chapter containing more in-depth information and access to PDF of Manual sections.

### Background:

Understanding stormwater runoff and pollution, its impacts, and how climate change plays a role:

#### Chapter 1: Introduction

[Link to Chapter](#)

Changes have been made but there is little impact on the general stormwater permits.

#### Purpose / Overview

- Describes the Manual's adoption, purpose, current and future revisions, users and organization, and applicability and regulatory basis

#### Changes / Revisions

- Summary of major revisions to the Manual and where to find information on future updates
- Updates to the organization and use of the Manual
- Updates to the applicability and regulatory basis of the Manual
- Updated descriptions of federal, state, and local regulatory stormwater programs as they relate to the Manual (moved to the Manual appendices)

#### How to apply it

- Overview tool for what to expect within this newest version of the Manual

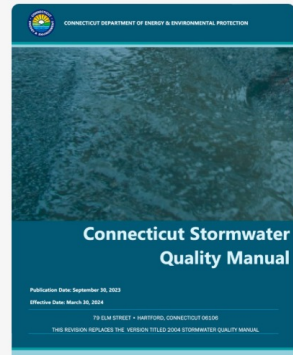
#### Chapter 2: Stormwater Impacts

#### Chapter 3: Preventing and Mitigating Stormwater Impacts

Welcome to the online version of the newly revise 2024 CT Stormwater Quality Manual! To explore the manual, use the navigation menu at the top of the page, the breakdown of chapters on the left, or search for keywords using the box below.

Search the manual

Search this site...



Click to access the full PDF of the 2024 Connecticut Stormwater Quality Manual



# Paying for it all: Stormwater utility guides and case studies



## Stormwater Utilities

Stormwater Utilities Fee Systems Credits Stormwater Utility Webinar Series Resources

### What is a Stormwater Utility?

Governor Lamont's Climate Bill, [House Bill 6441](#), passed in July of 2021, allows for Connecticut Municipalities to be able to implement Stormwater Utilities. Stormwater utilities are fees which generate direct, stable funding for stormwater management. They are often labelled as a fair and equitable source of funding as the fee is not based on property tax, but on impervious cover, allowing all properties, even tax-exempt properties, to contribute to the stormwater fund. On the boxes below, you can find a breakdown of the essentials of House Bill 6441:

THE STORMWATER UTILITY  
WEBINAR SERIES

Quick Find:

[Who has one?](#)

[Utilities in Action](#)

[Find Out More](#)

Who can Implement a Stormwater Utility?

Purpose of the Utility

Establishing a Fee

Stormwater Utility Budgets

Unpaid Fees

Enforcement

Collaboration on Stormwater Utilities

Website with breakdown of what stormwater utilities are, fee systems, credits systems, and more



## South Burlington Vermont Stormwater Utility

[www.sburstormwater.com](http://www.sburstormwater.com)

May 4, 2022

Presentation by:

David P. Wheeler, Stormwater Superintendent  
South Burlington Department of Public Works



Stormwater Utility Webinar Series ft. Vermont,  
New Hampshire, and Western Kentucky University

## Stormwater Utilities and MS4 Compliance Examples from across the country



Stormwater utilities are fees which generate direct and stable funding for stormwater management. Stormwater utilities function the same as other utilities, such as water and sewerage. Just as residents pay a fee for how much water they use to fund the drinking water services within their area, stormwater utilities charge residents and property owners on the amount of impervious cover on their property to fund the management needed to prevent and mitigate stormwater pollution and its adverse effects. Impervious cover charges allow for all properties, including those which are tax-exempt, to contribute to the stormwater fund, making for an equitable and fair fee. These funds can be used for various aspects of stormwater management, such as infrastructure repair, green infrastructure implementation, catch basin cleaning, and more, most of which are requirements of the Municipal Separate Storm Sewer System (MS4) permit.

The National Pollutant Discharge Elimination System permit, including the MS4 permit, is currently implemented in 46 states across the country. Stormwater utilities have been implemented within 41 states. And with the passing of Governor Lamont's Climate Bill in May of 2021, Connecticut municipalities have the opportunity to carry out their own stormwater utilities. These utilities are not dependent on geographic area or population size. Locations have ranged from Los Angeles, California, with a population of over 4 million to Indian Creek Village, Florida, with a population of 88 people. Even though stormwater utilities come in all shapes and sizes, they all address stormwater pollution and help achieve compliance with MS4 requirements.



Figure 1: Map of the United States with location of stormwater utilities, 2021

### CONTACT

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equal opportunity and prohibit

Stormwater Utility and MS4  
Compliance Factsheet

[nemo.uconn.edu/stormwater-utilities](http://nemo.uconn.edu/stormwater-utilities)

# Center for Land Use, Education, and Research

*Mission: 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*

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[clear.uconn.edu](http://clear.uconn.edu)

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