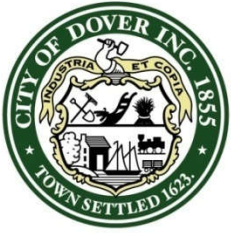


Stormwater and Flood Resiliency Utility Initial Joint Workshop Dover Ordinance Committee & Dover Utilities Committee

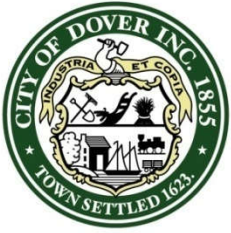
June 13, 2022

**Presentation By: Gretchen Young, PE
Environmental Projects Manager**



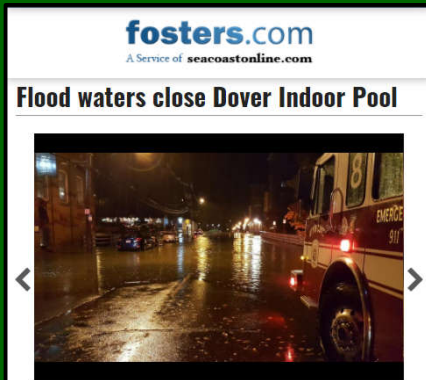
Workshop Goals:

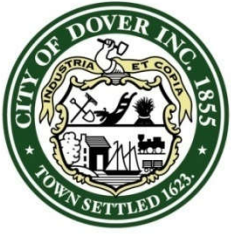
- **Share basic and important background information about what Stormwater and Flood Resiliency work looks like in the City of Dover**
- **Review the Charge and Process that was undertaken by the Stormwater and Flood Resiliency Ad-Hoc Committee.**
- **Discuss recommendations that came from that committee**
- **Outline next steps**
- **Discuss roles and asks of these two committees**
- **Collect a list of questions and ideas to address as we move forward**



Focus Topics:

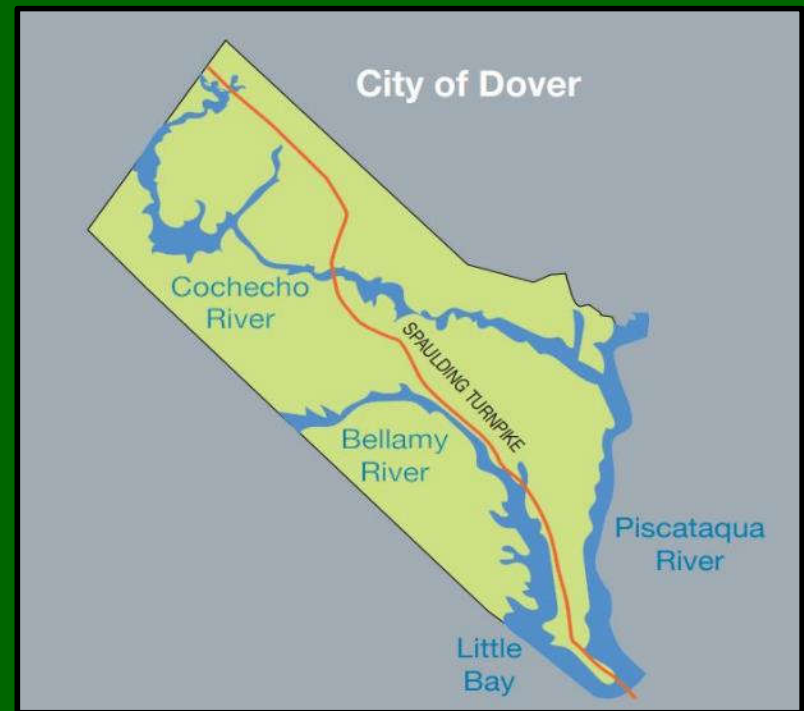
- Regulatory Compliance
 - CWA, MS4, and TNGP
- Point Source Discharge (WWTF @ Piscataqua River)
- Non-Point Source Discharge
 - Stormwater outfalls
 - All overland runoff
 - All groundwater flow
- Flooding and Flood Resiliency
- Infrastructure O&M
- Capital Improvement Projects
- Private Property
 - Residents and Businesses
 - Contractors and Developers
- Funding





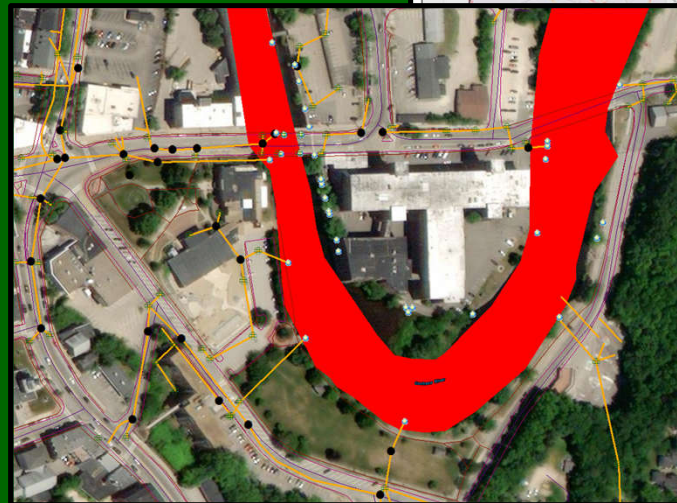
City of Dover

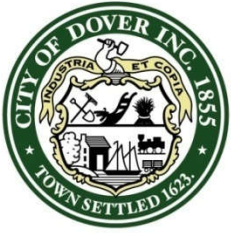
- Approx. 33,000 people and quickly growing.
- 29 square miles
- Served by a single WWTF
- Bordered to the south by the Great Bay and brackish rivers
- Freshwater rivers, streams, brooks and wetlands throughout





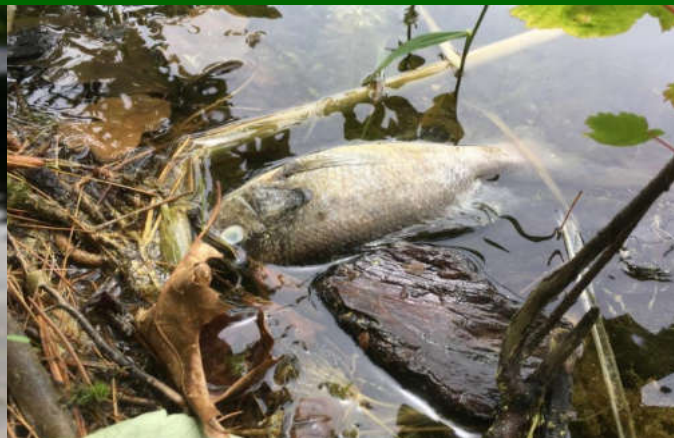
- **Bacteria/Pathogens**
- **Solids, Oils and Grease**
- **Metals**
- **Chloride (salt)**
- **Nitrogen**

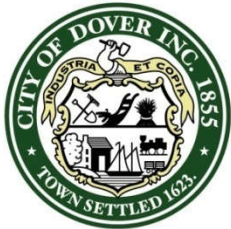




Water Quality Impacts

Pollutant	Sources	Impacts
Nutrients (nitrogen, phosphorus)	Fertilizer, wastewater effluent, pet waste	Algal blooms, reduced dissolved oxygen levels
Sediments	Soil erosion, road sand	Carry contaminants, reduce water clarity, impact aquatic habitat
Pathogens (viruses, bacteria, etc.)	Agricultural and pet waste, wastewater effluent, septic systems	Impacts drinking water, fish and shellfish consumption, recreation

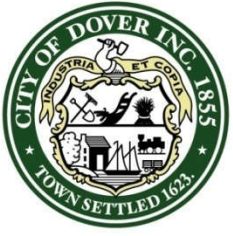




Water Quality Impacts

Pollutant	Sources	Impacts
Toxics (heavy metals, volatile organics, etc.)	Petroleum products, paints, herbicides, solvents, etc.	Poisonous to living organisms, persist in the environment
Chloride (salts)	De-icing salts, water softeners	Impact plants and animals in freshwater systems
Temperature	Runoff from warm surfaces such as parking lots	Reduced dissolved oxygen affects fish and other organisms





Clean Water Act regulates Point Source Discharge from the WWTF

Discharge Regulated for:

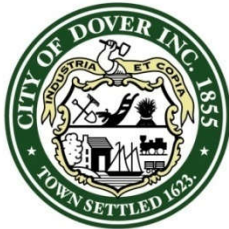
- TSS
- BOD
- Metals
- Industrial Pre-Treatment
- pH
- Bacteria
- Nitrogen (newly regulated)



MLE Process with Invent Mixers and Aquarius Technologies Aeration System

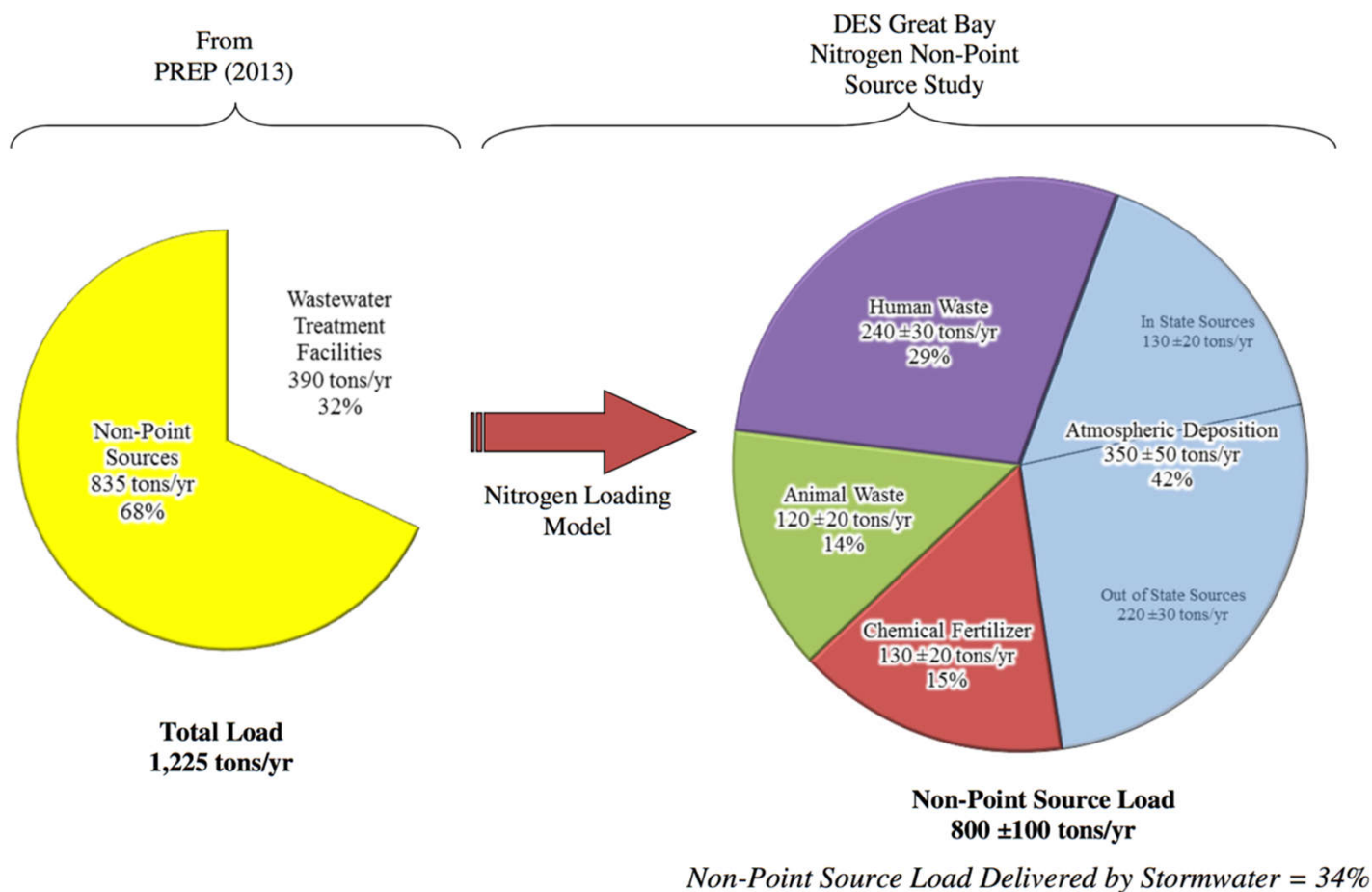


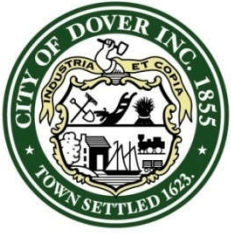
Four new Aerzen Channel and Septage Blowers and Two new Carter Plunger Pumps



Great Bay Total Nitrogen General Permit (TNGP)

Figure ES: Summary of Non-Point Source Nitrogen Loads to the Great Bay Estuary





Great Bay Total Nitrogen General Permit (TNGP)

Foster's Daily Democrat

LOCAL

Great Bay deal: Dover, Portsmouth, Rochester agree to share EPA permit costs

Kyle Stucker Fosters Daily Democrat

Published 5:32 p.m. ET March 26, 2021 | Updated 5:56 a.m. ET March 27, 2021

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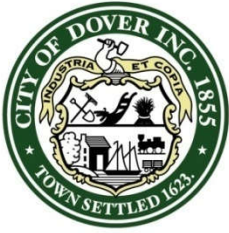


The Great Bay from Adams Point Wildlife Management Area in Durham. *Rich Beauchesne/Seacoastonline, file*

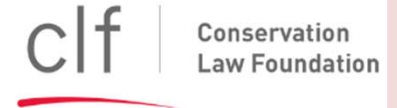
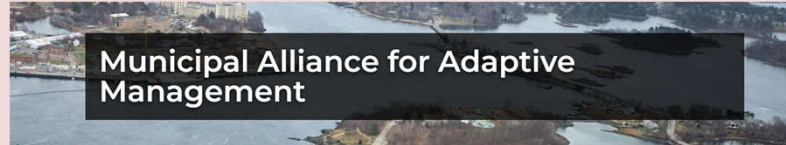


TNGP – What's the plan?

- a. • Approach to monitor the ambient water quality
- b. • Method to track N reductions and additions
- c. • Nitrogen Source Reduction
- d. • 5-year plan to provide report of evaluation and determination of load based thresholds.
- e. • Timeline for completing TMDL

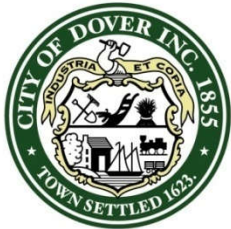


TNGP – The Plan is to Collaborate & Pool Resources



Great Bay 2020

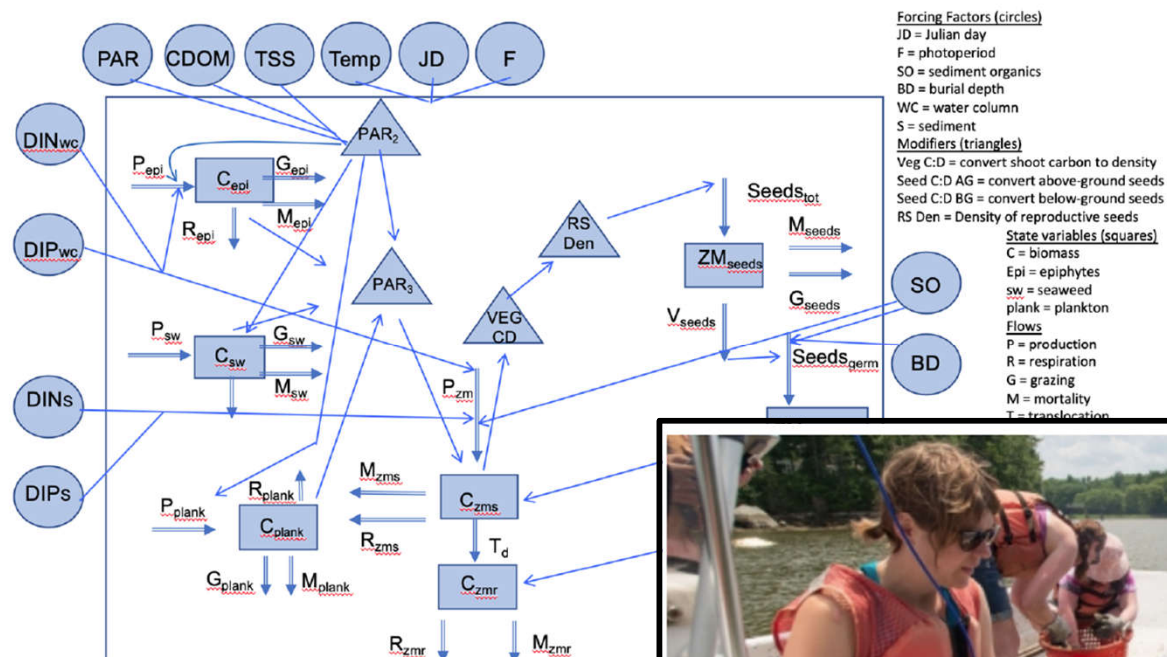




TNGP – Scientific Research & Monitoring

Piscataqua Region Monitoring Collaborative (PRMC) & Research and Monitoring Plan (RAMP)

Figure 3. Detailed conceptual model of eelgrass ecosystem (adapted from Jarvis et al. 2014).



Conceptual diagram for eelgrass production and sexual reproduction. Circles = forcing factors, squares = state variables, thick arrows = flows, and thin arrows = connections. Temp, JD are not connected to minimize diagram complexity.



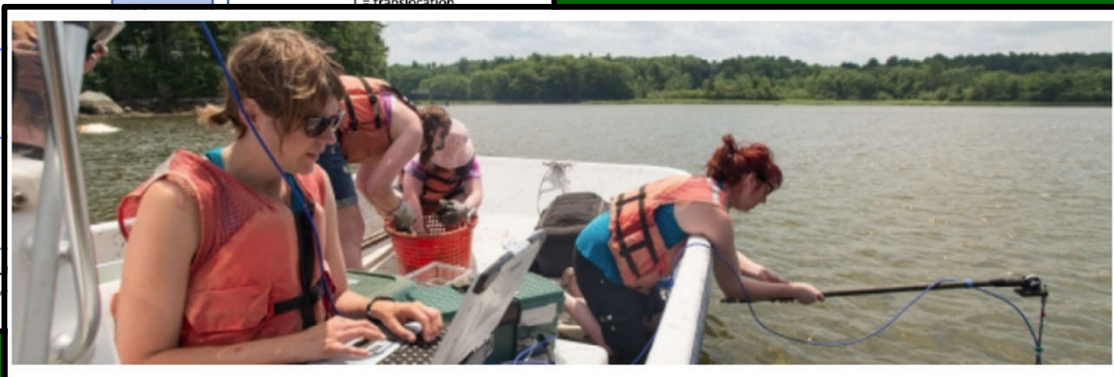
PREP

Piscataqua Region Estuaries Partnership



University of New Hampshire

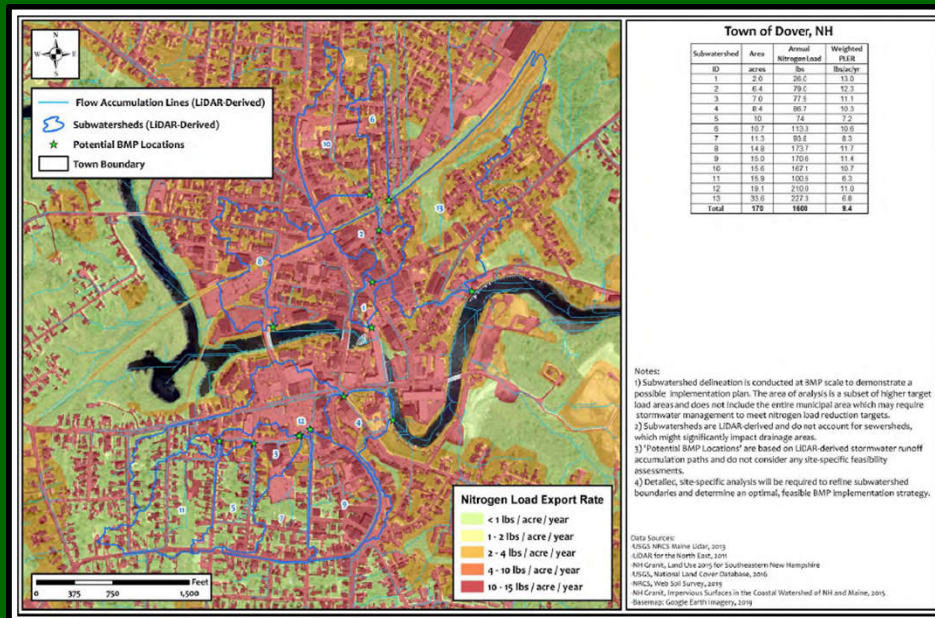
School of Marine Science and Ocean Engineering

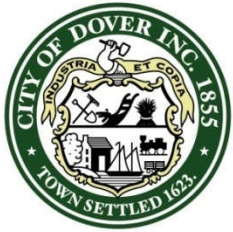




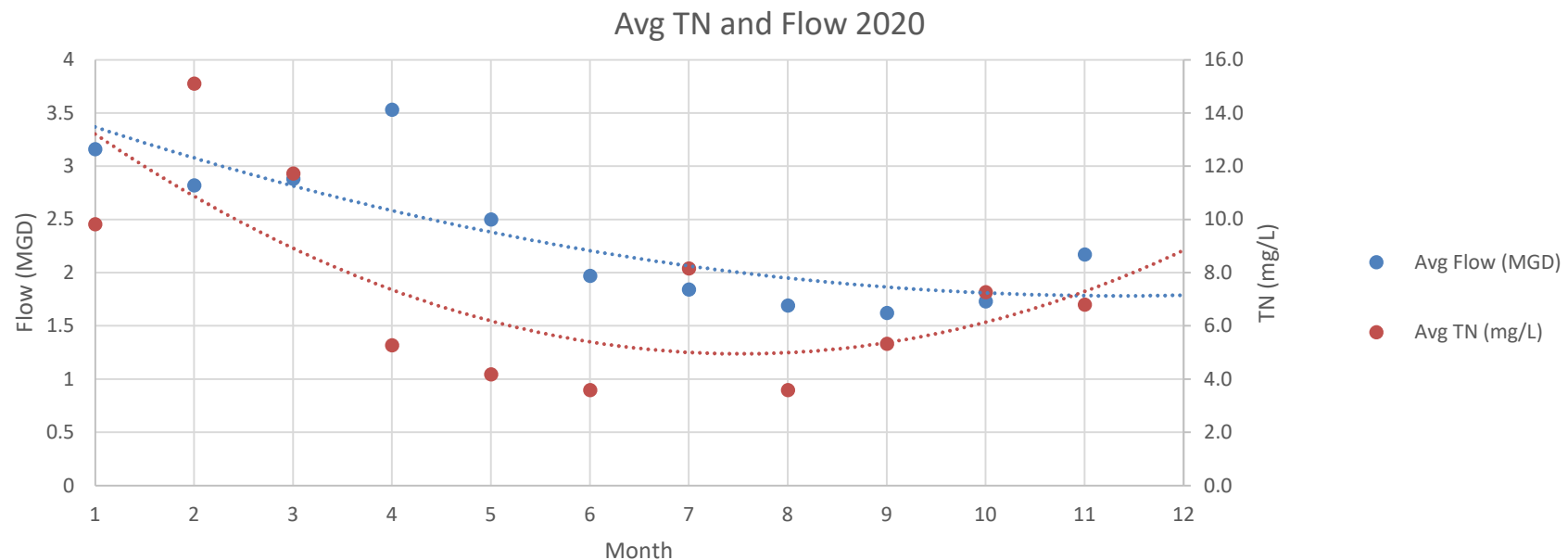
TNGP – Scientific Research & Monitoring

1. What questions do we need answers to?
2. Where should we focus research?
3. What is the big picture?
4. What information do we need?
5. What is the information really telling us?





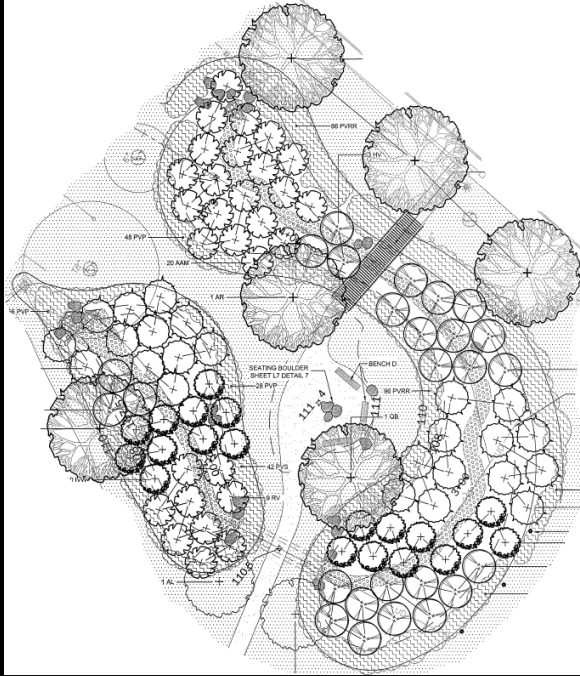
TNGP Compliance – At the WWTF



- \$12,000,000 upgrade in 2015 + added operating cost
- Removing I/I to prevent peaking (\$300,000 per year)
- Additional secondary treatment funded by ARPA (\$3,000,000)
- >22,000 lbs. TN/year



TNGP Compliance - Everywhere Else

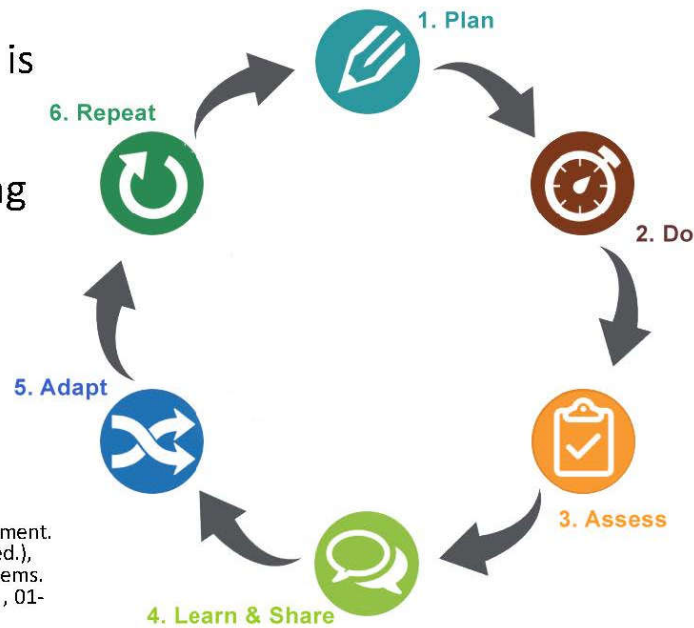




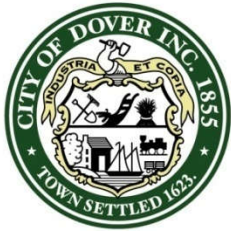
TNGP Compliance - Everywhere Else

Adaptive management is an approach to natural resource management that emphasizes learning through management where knowledge is incomplete, and when, despite inherent uncertainty, managers and policymakers must act.

(Allen, C. and A. Garmestani. Adaptive Management. Chapter 1, Craig R. Allen, Ahjond Garmestani (ed.), Adaptive Management of Social-Ecological Systems. Springer Netherlands, Dordrecht, Netherlands, , 01-10, (2015)

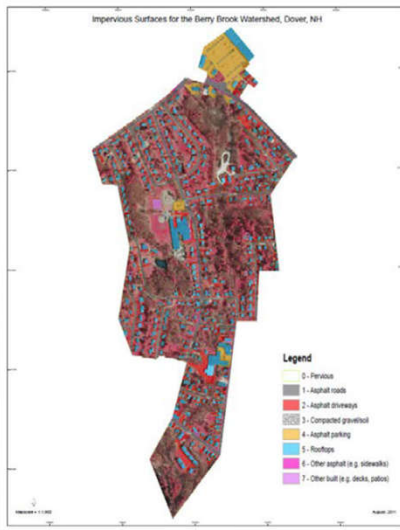


No Set Targets



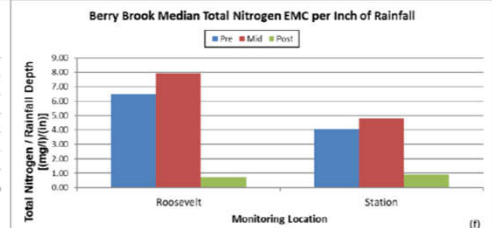
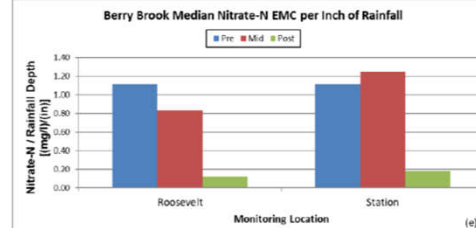
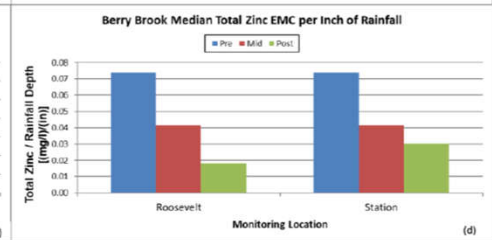
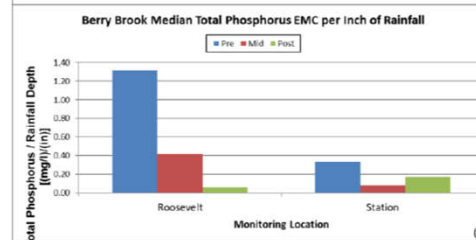
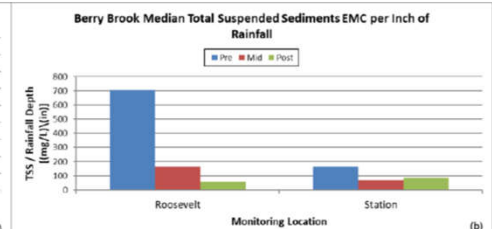
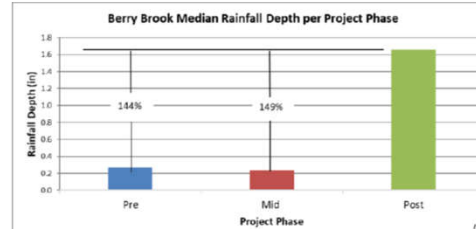
TNGP Compliance for Dover - Multi-Beneficial

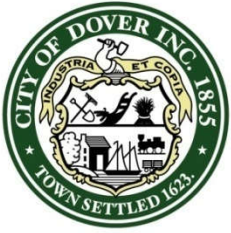
Berry Brook Watershed Overview Impervious Surfaces



Surface	Area (acres)
Total Watershed	185
Pervious	129.4
Asphalt Roads	14.3
Asphalt Driveways	
Compacted Soil	
Parking Lots	
Rooftops	
Other Asphalt	
Other (decks, patios)	
Impervious Total	

Source: Adapted from Mapping Impervious Surfaces in the Berry Brook Center, August, 2011





Municipal Separate Storm Sewer Systems (MS4) Permit



65 miles of drainage pipe
101 miles of open drainage
450 outfalls/discharge locations
140 culverts
100 manholes
3200 catch basins
100 Best Management Practices



Stormwater Management Program

Stormwater Management Program (SWMP)

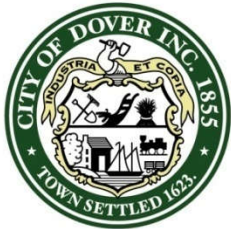
City of Dover, NH

Permit Year 3

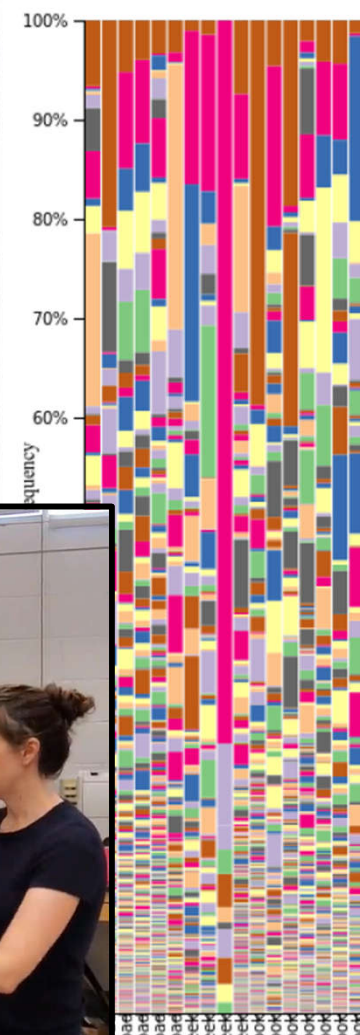
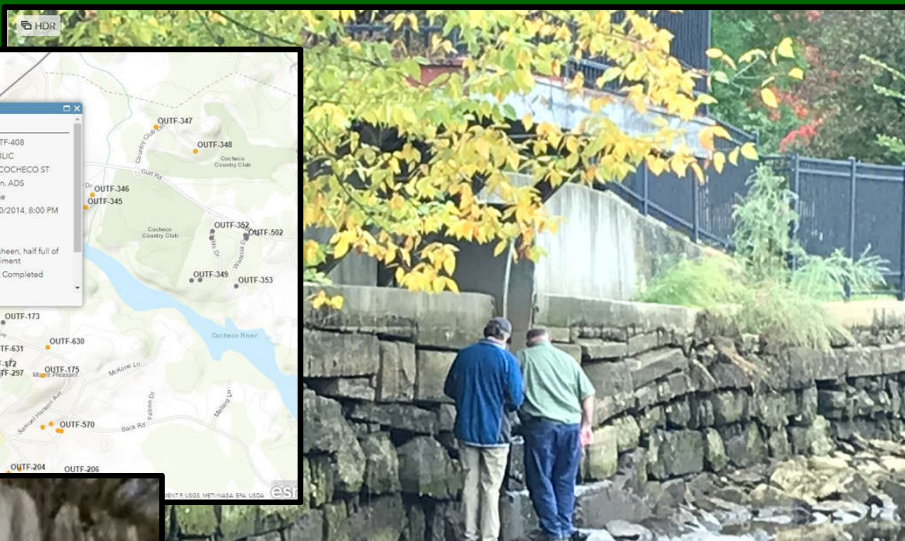
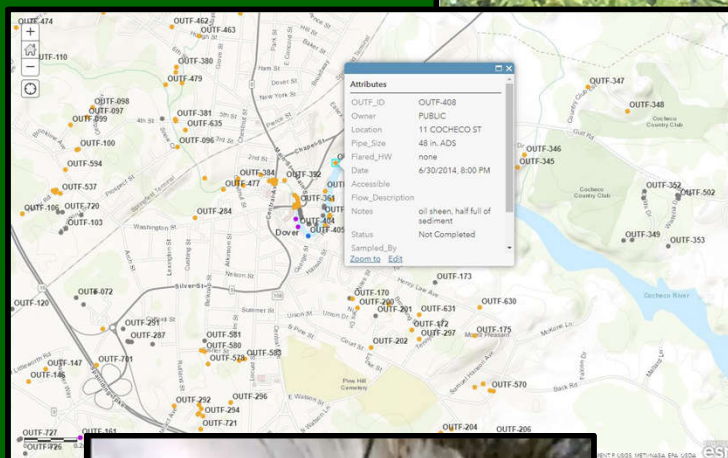
EPA NPDES Permit Number NHR041000

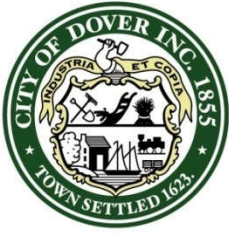
- Outreach and Education
- Public Involvement
- Illicit Discharge Detection and Elimination (IDDE)
- Construction Site Runoff
- Post Construction Management
- Good Housekeeping





Illicit Discharge Detection and Elimination (IDDE)





Construction Runoff

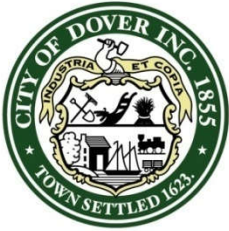
City of Dover
Community Services
Engineering Division



Pre-Construction Check List

- 1) _____ Stamped Plans-Required on Site at all Times
- 2) _____ Construction Entrance/Roadway must be kept Swept
- 3) _____ Erosion Control-Must Be Maintained at all times
- 4) _____ NOI applied For
- 5) _____ S.W.P.P.P inspections must be done by a CPESC/PE
- 6) _____ Wetlands Clearly Marked-and 50' Buffers
- 7) _____ Wetland Permit Displayed
- 8) _____ Construction Sequence- (Must be Followed)
- 9) _____ Water-All Fittings to be North American
- 10) _____ Water Service Shut offs must not be in place





Post Construction Management

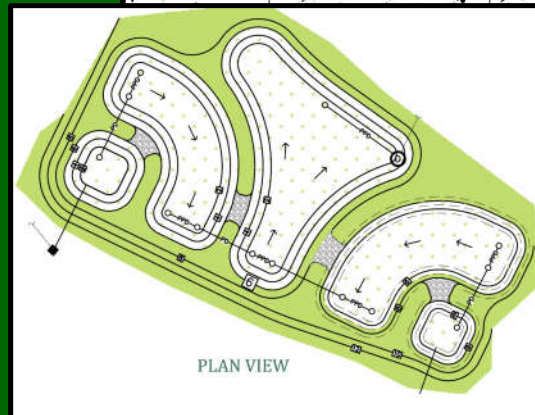
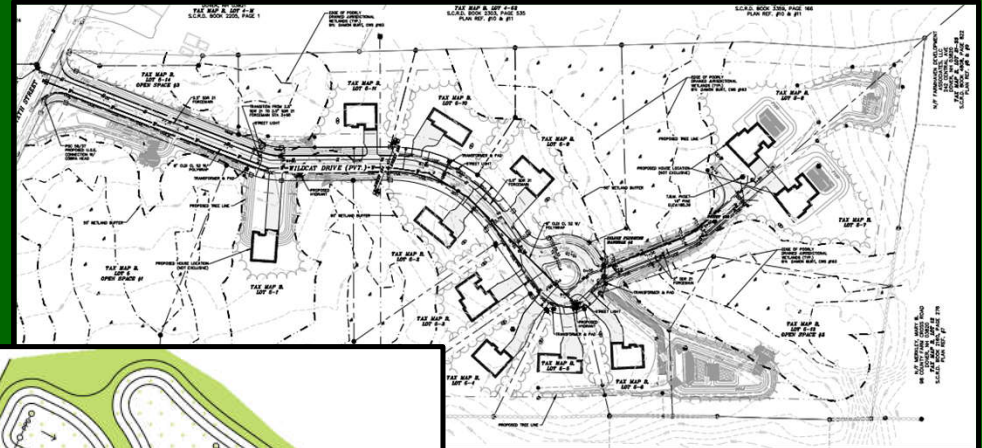


MODEL STORMWATER STANDARDS FOR COASTAL WATERSHED COMMUNITIES

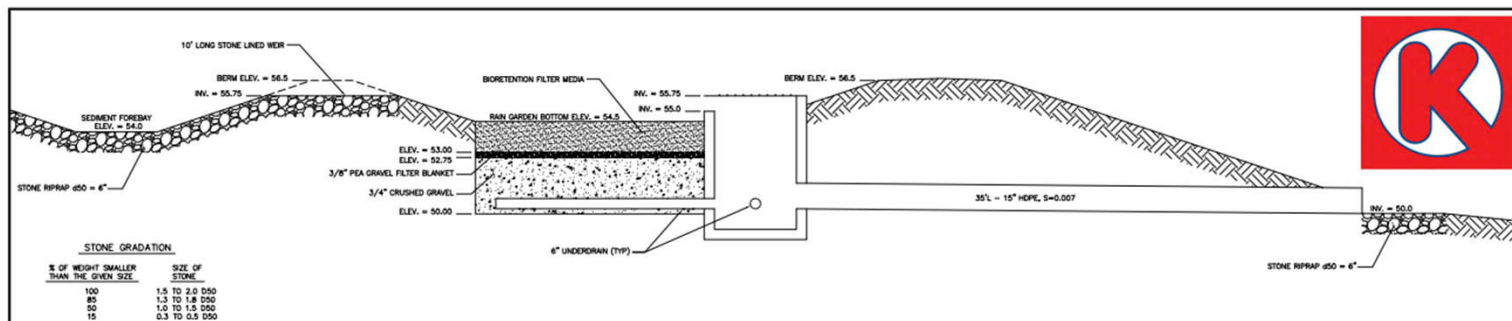
Prepared by the University of New Hampshire Stormwater Center and
The Rockingham Planning Commission
December 2012



This project was funded under the Coastal Zone Management Act by NOAA's Office of Ocean and Coastal Resource Management in conjunction with the New Hampshire Coastal Program.



PLAN VIEW





Post Construction Management



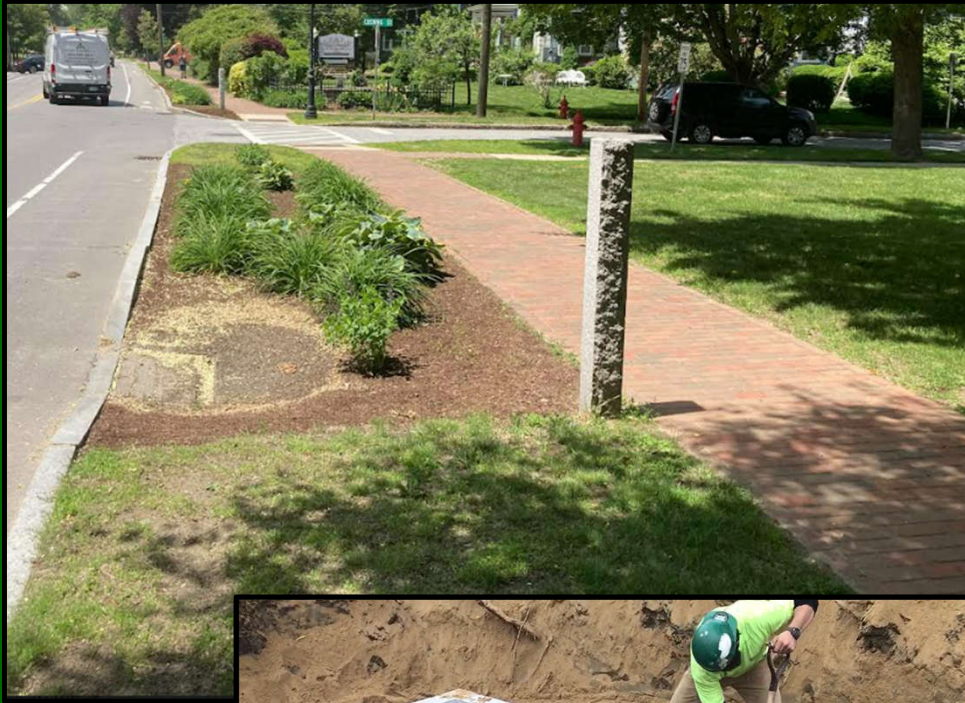


Post Construction Management





Post Construction Management





Post Construction Management





Good Housekeeping

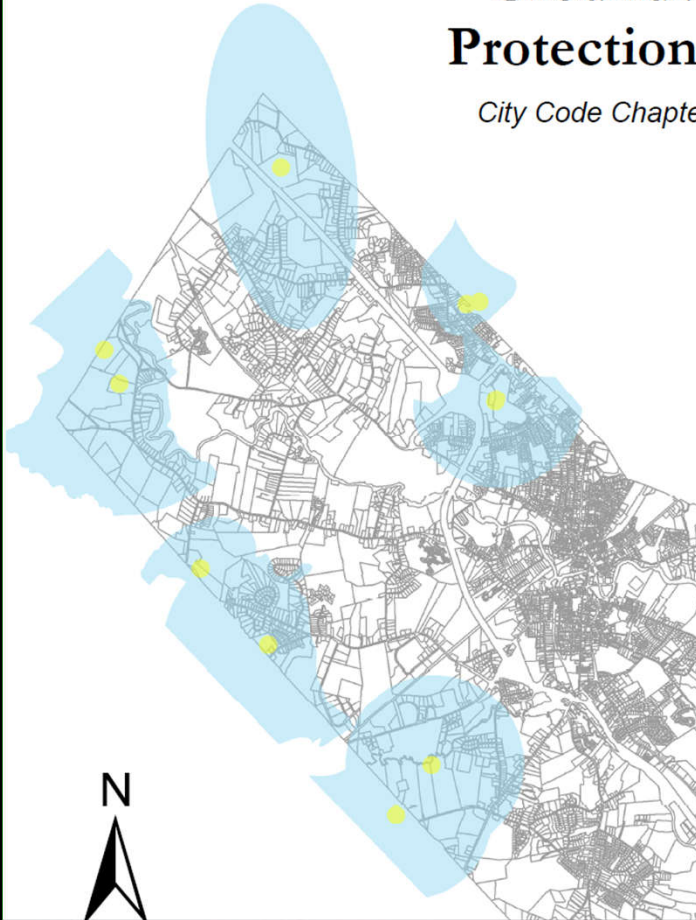




Good Housekeeping

Groundwater Protection Zones

City Code Chapter 170-28.3

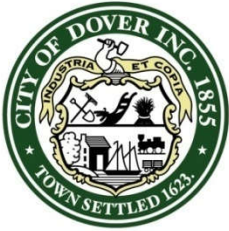




Maintain Existing Infrastructure

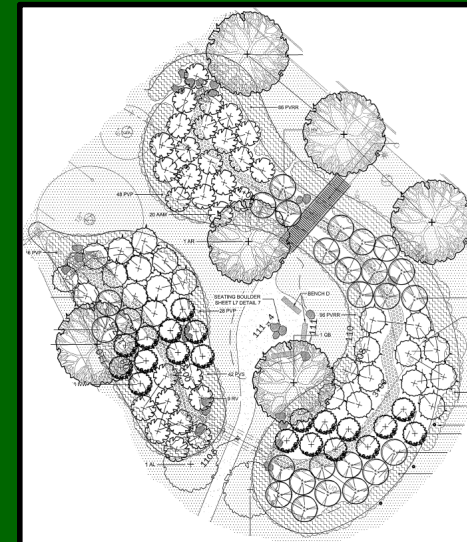
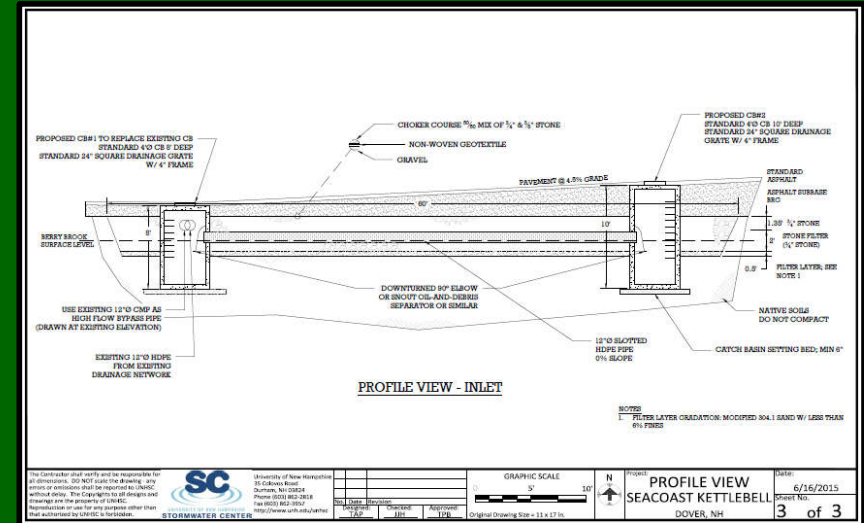
Approximately 25% of pipe segments in the urban core have a “likelihood of failure” rating greater than 3 out of 5





Maintain Existing Infrastructure

City owns many different BMP's... All need ongoing maintenance





Maintain Existing Infrastructure

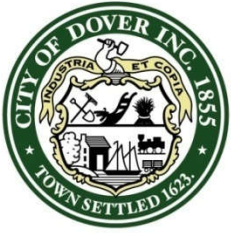


3 years of growth



Vegetation removed





Flood Response and Resiliency



1896 – Bracewell Block Flood

1936 – Flood Event

2006 – Mother's Day Flood

2007 – Patriot's Day Flood



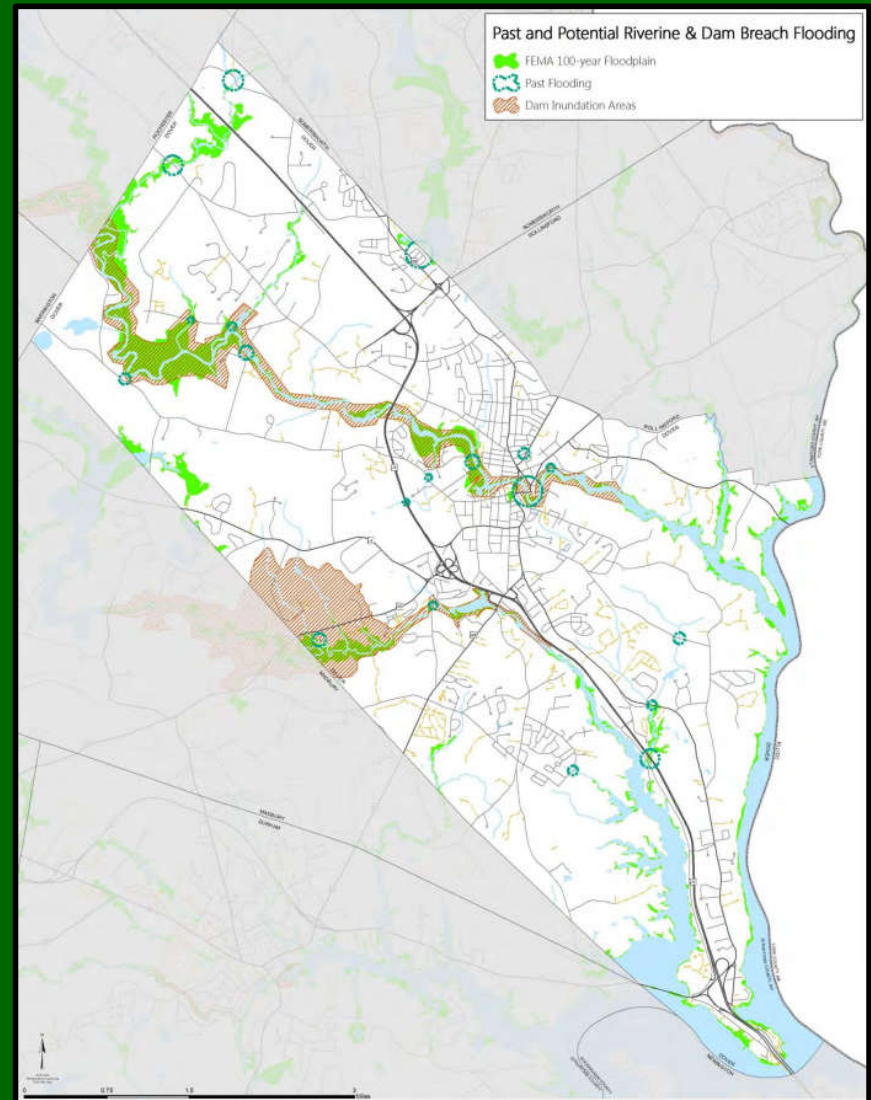


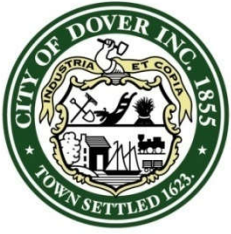
Flood Response and Resiliency

Flooding can occur anywhere in the City, but more likely within 100-year floodplain

Smaller storms can still flood significant portions of the 100-year floodplain

Roughly 944 acres in Dover located within 100-year floodplain





Climate Risk in the Seacoast (C-RiSe) Vulnerability Assessment

Sea-Level Rise Scenarios:
1.7, 4.0, and 6.3 ft.



Sea-Level Rise + Storm Surge:
1.7, 4.0, and 6.3 ft. + 100-yr storm



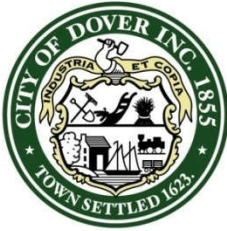


Flood Response and Resiliency



Dam Removal
Added Capacity in System
Slow Down Runoff – Infiltrate
Flood Storage Projects
Raise Infrastructure





Flood Response and Resiliency



CITY OF DOVER, NEW HAMPSHIRE MASTER PLAN
2018 Climate Adaptation Chapter

Planning Today for a Resilient Tomorrow

Climate Adaptation Chapter – Implementation Strategies

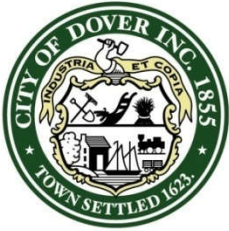
Action Items	Climate Topic	Interplay Among Other Climate Topics						Priority	Responsible Party	Chapter Reference	
		W&Q	HS	F	E	I	NR				
Outreach and Engagement											
1	Encourage residents to implement water efficiency practices and conservation techniques by educating them on their water usage statistics, potential water supply issues, and the benefits of participating in water audits	W&Q	X	X		X	X	X	O	Utilities Commission	Pgs. 12-13
2	Encourage private well owners in vulnerable areas to test their water annually for salinity levels from saltwater intrusion and road salt	W&Q	X	X					S	Community Services Department	Pg. 17
3	Support efforts to provide education on the health-related impacts associated with poor air quality to targeted populations living with chronic diseases	HS		X					L	Health Committee	Pg. 19
4	Develop an action plan to effectively communicate alerts and provide comprehensive measures that can be taken during emergency events aimed at vulnerable populations, as well as conduct outreach about local emergency preparedness and response plans and evacuation protocols	HS		X		X	X		S	Fire and Rescue	Pgs. 17-22
5	Provide information about vector and vector-borne diseases to the public, offer tips on how residents can protect themselves with a focus on children in the school district	HS		X					L	Health Officer	Pgs. 20-21
6	Use widely visible public spaces, such as Henry Law Park, as opportunities to provide education on climate change impacts (e.g. sea-level rise)	HS	X	X				X	I	Planning	Pgs. 1-3
7	Partner with groups such as the NH Food Alliance and Seacoast Local to promote the distribution of fresh local food, provide agricultural awareness and education programs in schools, and support and align with existing efforts	F	X		X			X	S	Energy Commission	Pgs. 24-26
8	Promote clean water activities to sustain and improve aquaculture opportunities such as shellfish and seaweed harvesting, and other fisheries	F	X	X	X		X	X	S	Planning Department	Pgs. 26-27
9	Develop outreach materials that highlight the success and energy cost avoidance of the Johnson Control Inc. project, and encourage the City to participate in similar projects in other publically owned buildings	E				X	X		I	Energy Commission	Pgs. 30
10	Promote programs that provide opportunities for low-income and other vulnerable populations/groups to have access to affordable and renewable energy sources, as well as support the improvement of the City's alternative transportation and pedestrian options	E		X		X	X		S	Utilities Commission	Pgs. 32-33
11	Provide education and outreach materials on distributed power generation opportunities at the municipal level to encourage the City to increase independence and resilience against growing energy challenges	E				X	X		S	Energy Commission	Pg. 34

Climate Topics
W&Q: Water Availability and Quality
HS: Health and Safety
F: Food
E: Energy
I: Infrastructure
NR: Natural Resources

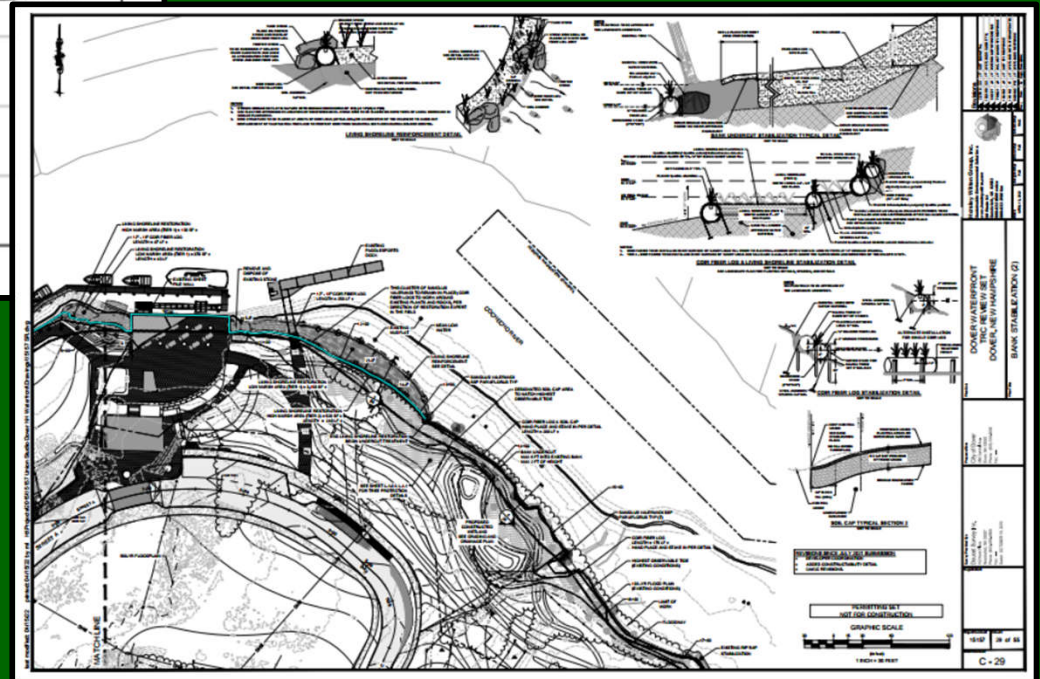
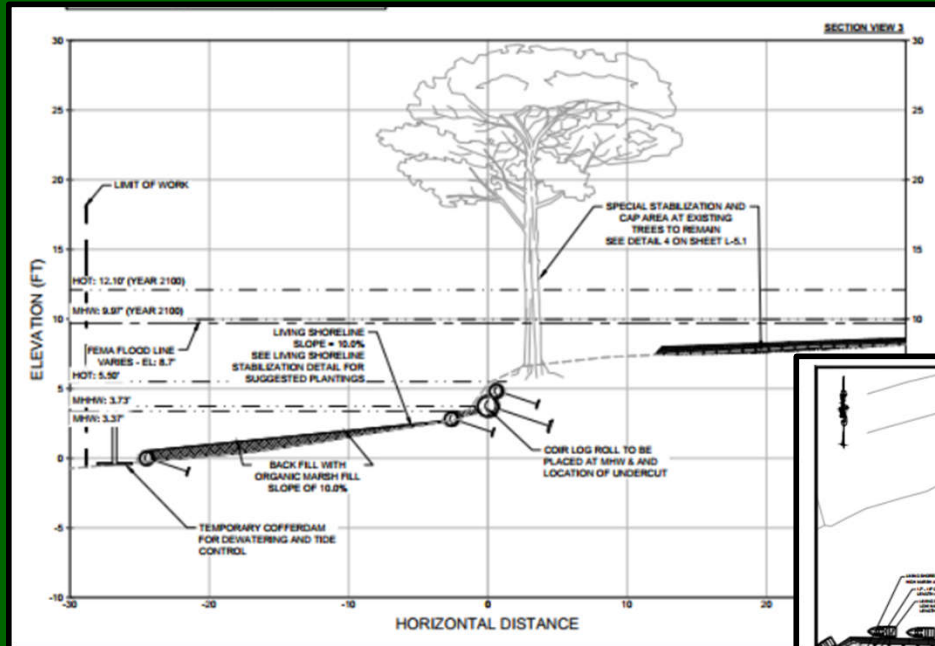
59

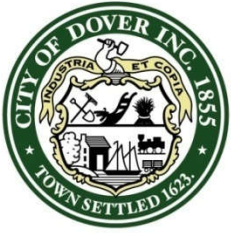
Priority
Ongoing: Actions which are continuous or already being carried out
Immediate: Actions which should be undertaken in 1-2 year
Short: Actions which should be undertaken in 3-5 years
Long: Actions which will take more than 5 years to initiate and complete

FINAL DRAFT 2.14.2018

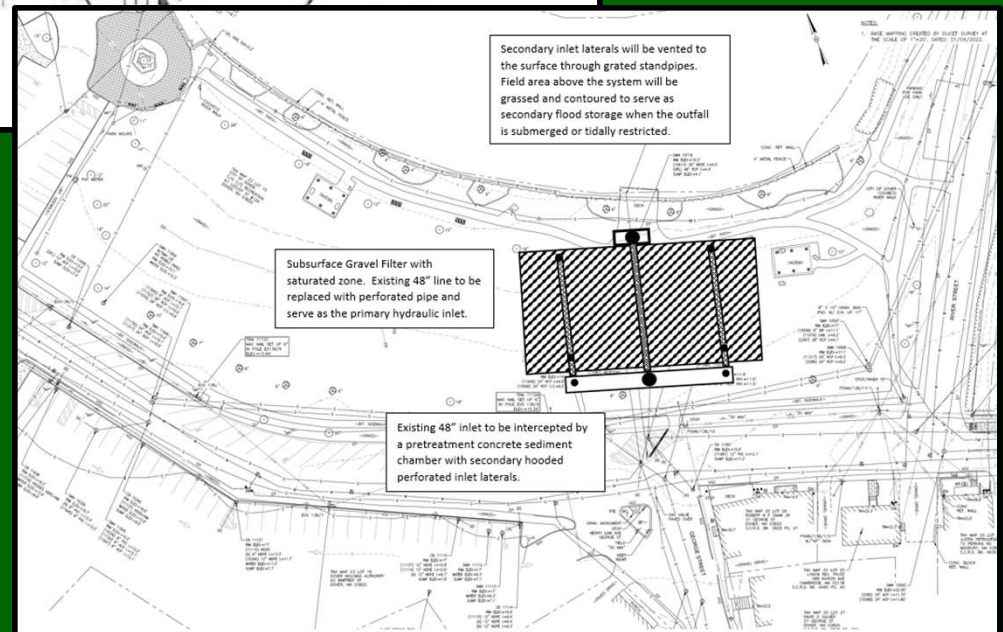


Stormwater and Flood Projects





Stormwater and Flood Projects





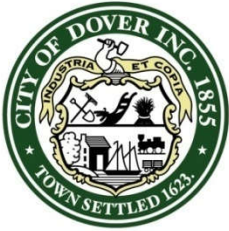
Other Capital Investments

Dover plans first-in-NH environmental project

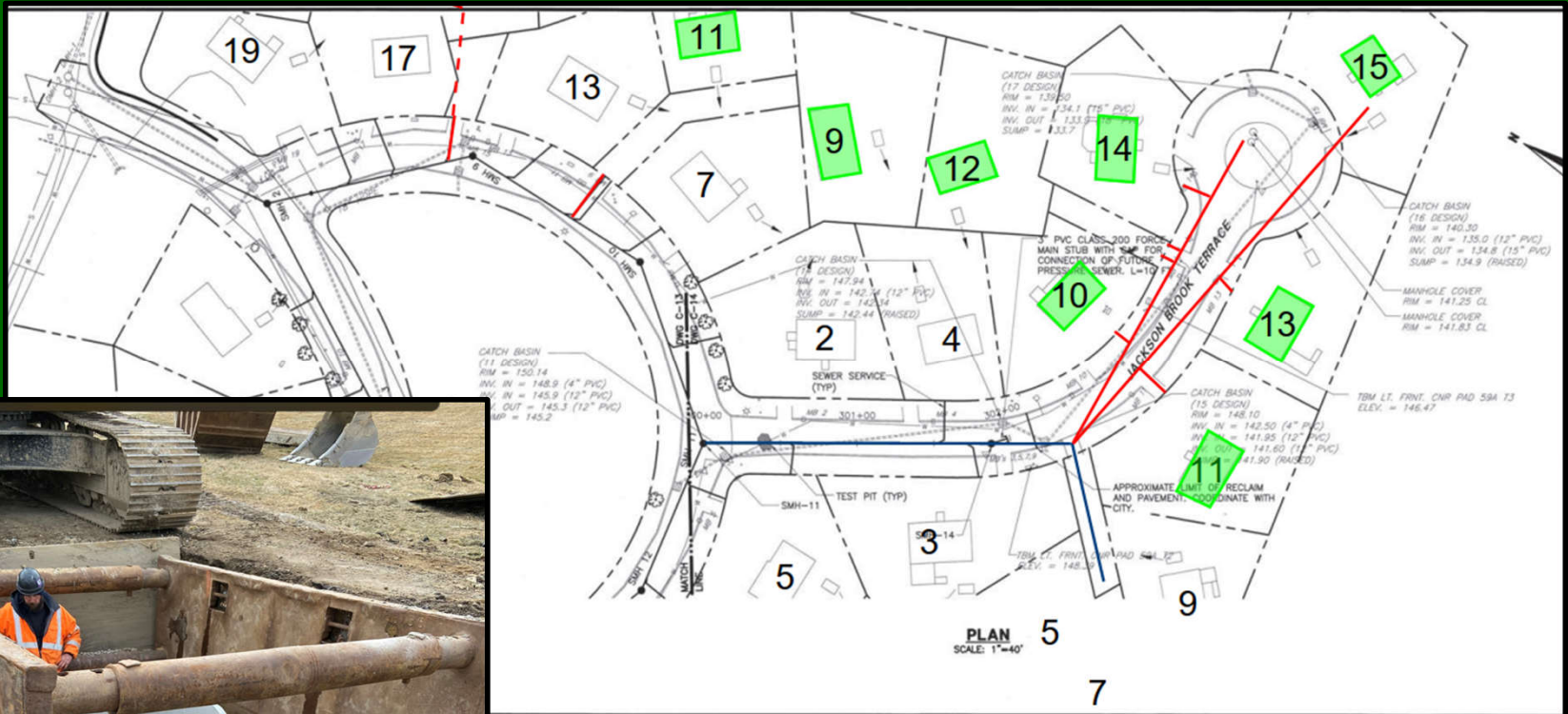
Jeff McMenemy Fosters Daily Democrat

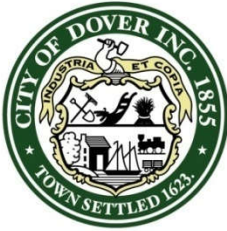
Published 4:53 p.m. ET Oct. 20, 2020





Other Capital Improvements





Property Owner Responsibility



Help keep it clean this spring by following these water quality tips

Another spring is fast-approaching and we still find ourselves spending significant time at home during a pandemic. Fortunately, warmer weather will bring renewed opportunities to enjoy our outdoor spaces. Are you thinking about your lawn care or garden plans? Whether you are looking to get outside or engage your children in a project, this season is a great time to develop some new habits that will improve your green thumb, help protect the environment, and save money.

Whatever we do in our yards affects lakes, rivers, streams and bays downhill. By adopting a few simple practices, we can protect the health of water bodies we love while taking care of ourselves and the people around us by sheltering at home. These tips will help grow healthy lawns and protect water quality while we are spending more time at home.



1 Choose the right grass seed. The best seed mixes include low maintenance varieties with higher % of fine-leaf fescues and turf- or compact-type tall fescues, and lower % of Kentucky bluegrass and perennial rye grass.



2 Mow smart. Leave grass at least 3" high. Cut no more than one-third ($\frac{1}{3}$) of the blade each time you mow to encourage longer, stronger roots. Leave the grass clippings after mowing so they can return nutrients to the soil.



3 Don't overwater. 1" of water per week (from rain or irrigation) is usually enough. Overwatering can cause nutrients to move out of root zones and into waterbodies or groundwater.



4 Have your soil tested to learn more about specific characteristics and needs of your lawn. Contact UNH Cooperative Extension: extension.unh.edu/programs/soil-testing-services

Only if your lawn requires added nutrients from fertilizer:



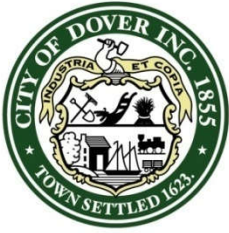
5 Avoid overapplying. Measure the area where you plan to apply and calculate the square footage. For lawns 10+ years old, apply half ($\frac{1}{2}$) the amount recommended for your square area one time per season. New lawns may need another application. Don't apply more than four times per season.



6 Choose the right fertilizer. Select fertilizers with zero or low phosphorous unless a soil test says otherwise. Slow release nitrogen fertilizer is generally preferable. Over-applying fertilizer (any type) can cause water quality problems.



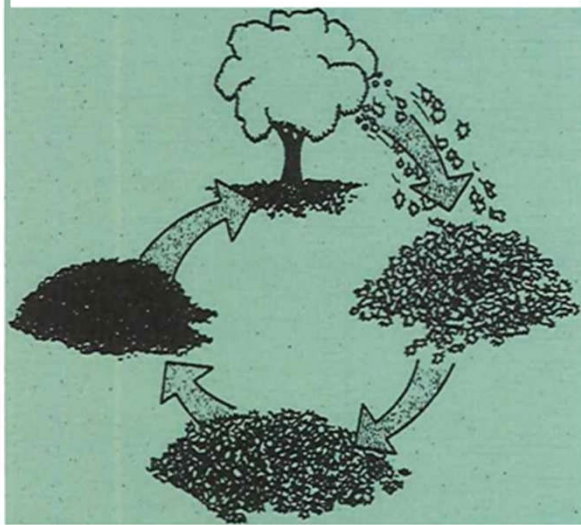
7 Know when and where to apply. Apply only after spring "green up" and before mid-September. Avoid applying in mid-summer. Never apply near waterbodies or storm drains.



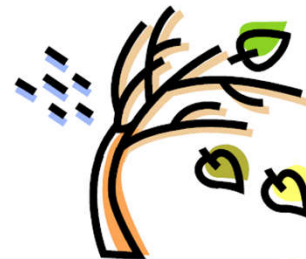
Property Owner Responsibility

BACKYARD COMPOSTING

Nature's Way
of Recycling



Please
do not dump
your leaves,
grass clippings,
or brush



Decaying yard waste kills aquatic animals in streams

Decaying yard waste in streams depletes the oxygen that aquatic animals need to survive. Leaf piles and grass clippings decompose in the streambeds by using the oxygen that other organisms such as dragonfly larvae, crabs, and fish need to live.

Yard waste on stream banks smothers natural vegetation

When you dump leaves or grass on the shoreline, you block sunlight and smother the natural plant life that provides food and cover to animals such as turtles, ducks, chipmunks, and deer.

Dumping yard waste contributes to stream algae and odors

The leaves and grass clippings do not have to be dumped directly into the creek for this to occur. Seepage from the piles on the banks will slowly make its way into the water. When the nutrients are plentiful, algae proliferate and form large, green mats on the surface of the water. These unsightly mats give off odors and also use oxygen as they decay.

Dumping yard waste in or near streams is against the law!

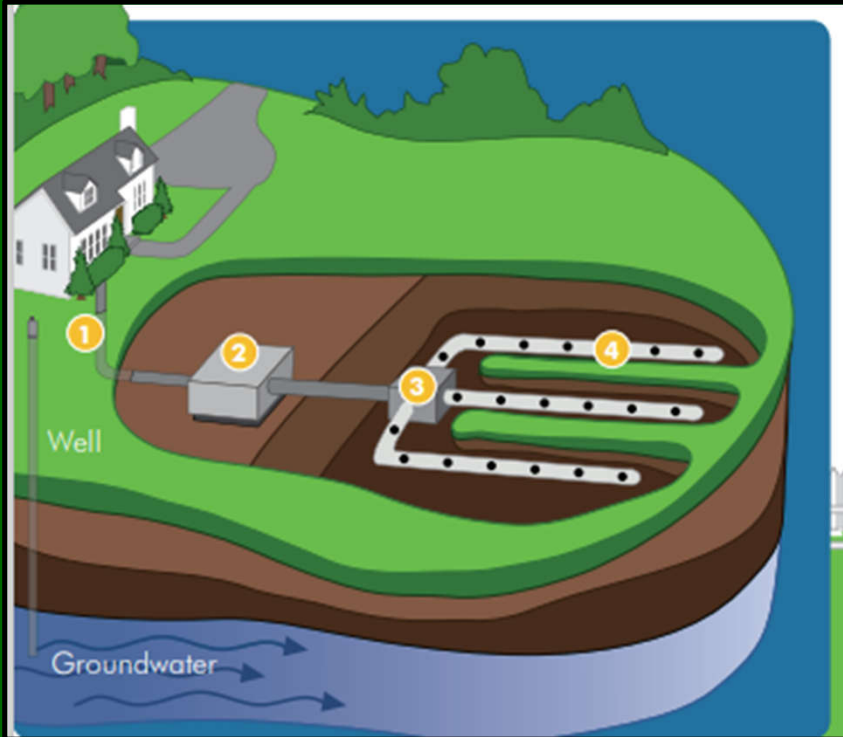
The final reason not to dump your yard waste in or near the Creek is because it is against the law. RSA 482-A:3

**RAKE IT
OR
LEAVE IT**

*What to do with your
leaves and grass
clippings to protect
New Hampshire Waters*



Property Owner Responsibility



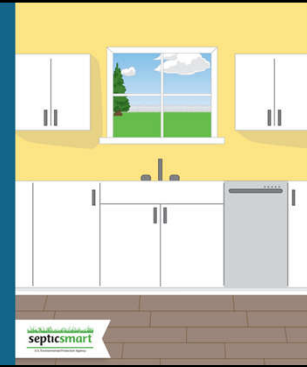
National Septic Smart Week a good time to check septic systems

Even though most Dover residents are connected to the sanitary sewer line, there are still thousands of Dover residents who rely on a septic system to handle wastewater. This week is National Septic Smart Week to encourage septic tank users to follow best practices to avoid costly bills and polluting the environment.



Do Your Part, Be SepticSmart

To protect this home's plumbing, please keep grease, fats, and harmful chemicals out of the drain.

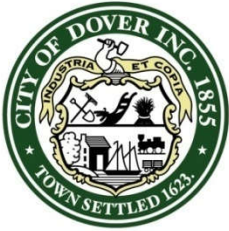


Protect It and Inspect It!



Regular septic system maintenance can save homeowners thousands of dollars and protect public health. Learn more at www.epa.gov/septic.





Property Owner Responsibility

YOUR STORM DRAIN

IS JUST FOR RAIN!

RAIN GARDEN

A rain garden is a sunken, flat-bottomed garden that uses soil and plants to capture, absorb, and treat stormwater. This helps to reduce stormwater runoff and recharge groundwater.



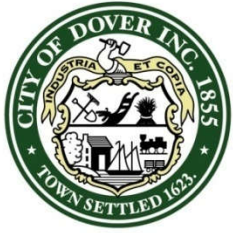
EVERY DROP
Small Changes. Big Difference.

We love our dogs! But dog waste carries harmful bacteria that can make our waters unsafe for drinking or swimming. So always pick it up and throw it in the trash!



Property Owner Responsibility





Permit Compliance

MS4 Permit:

New Hampshire Small MS4 General Permit

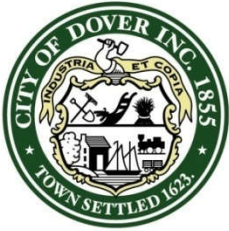
Annual Report

City of Dover

Permit Year 3

July 1, 2020 through June 30, 2021

EPA NPDES Permit Number NHR041000



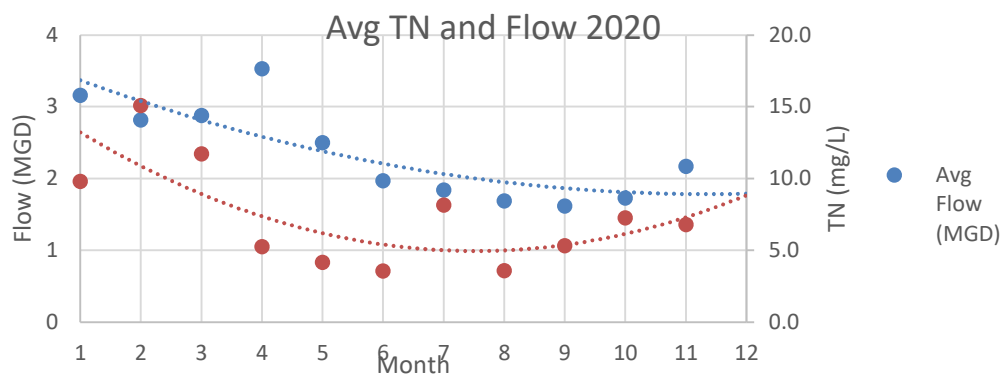
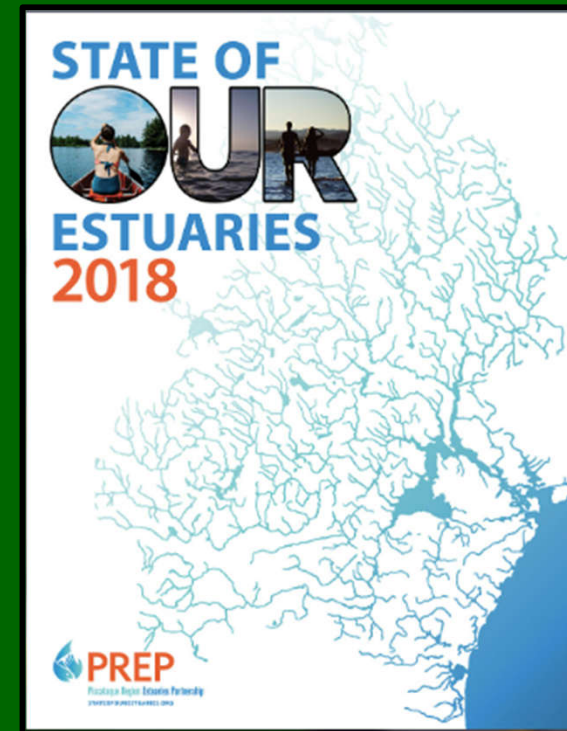
Permit Compliance

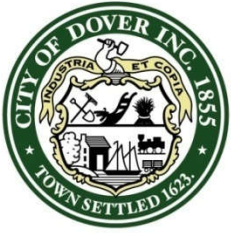
TNGP Permit:

Dover Municipal Report

Land Use Conversion Table

Soils		Existing Conditions			Future Conditions			Report of Origin
Hydrologic Group	Acres	Land Use Type	Acres	Impervious and/or Paved Surfaces Acres	Land Use Type	Acres	Impervious and/or Paved Surfaces Acres	
C/D	5.77	Residential	5.77	0.06	Commercial/Institutional	5.77	1.06	Broadview Urgent Care Animal Hospital
A	0.45	Residential	0.45	0.17	Residential	0.45	0.25	Hanson Court Apartments
A	1.65	Residential	1.65	1.19	Residential	1.65	0.98	Roberts Road Reconstruction, Dover NH
A	2.04	Residential	2.04	0.76	Residential	2.04	0.75	Locust Street Inn & Locust Common
B	0.61	Residential	0.61	0.06	Residential	0.61	0.35	
C	0.47	Residential	0.47	0.00	Residential	0.47	0.22	





Funding



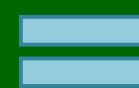
Operating
Budget
±\$1M



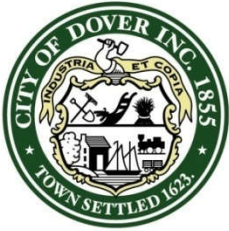
Capital
Projects
±\$2.25 M



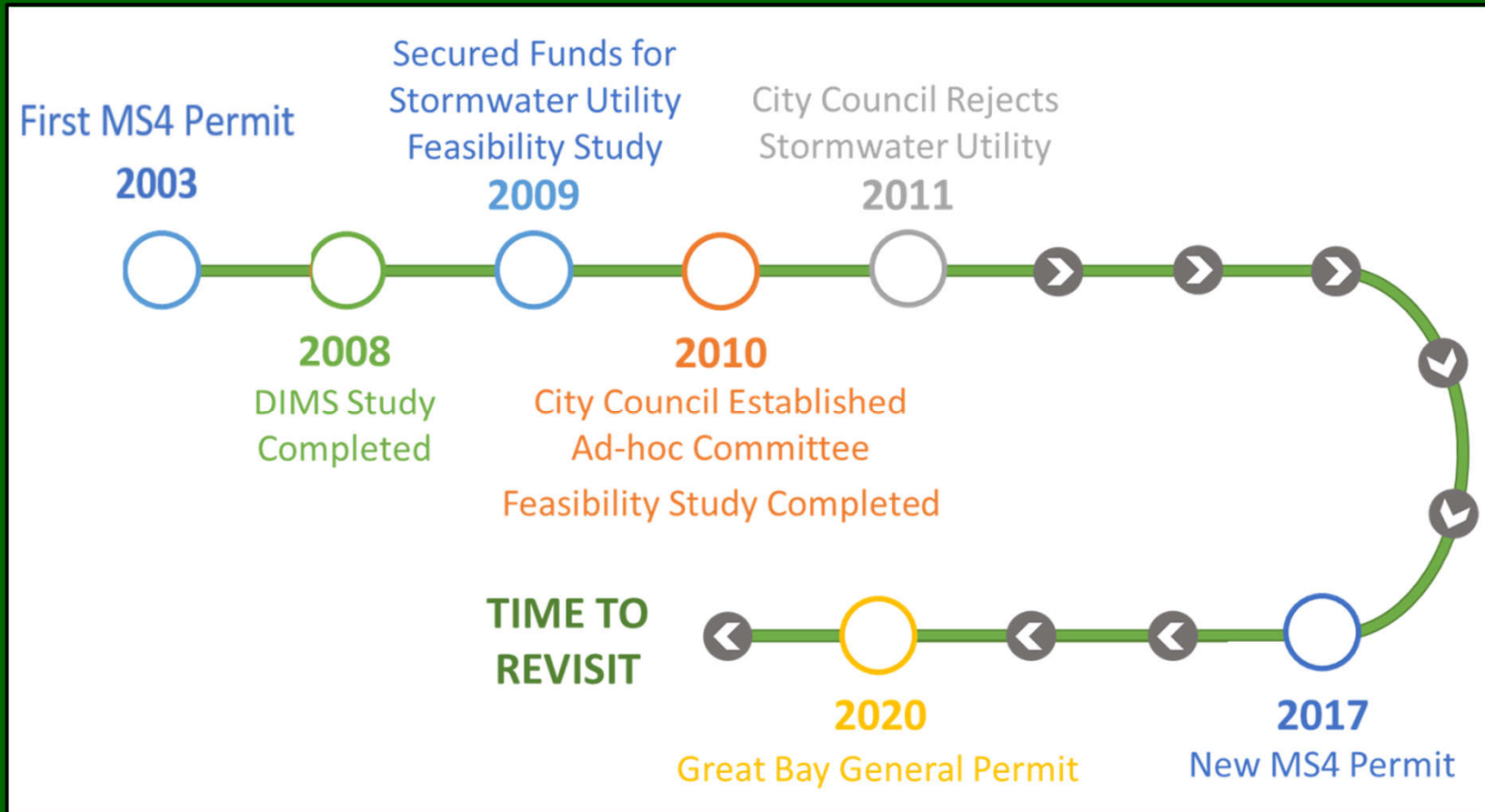
Other
Expenses
±\$0.25

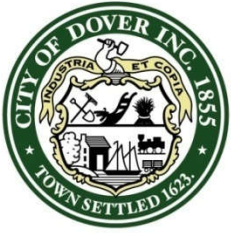


Stormwater
Costs
±\$3.5M
(All from
General Fund)



Funding





Funding Ad-Hoc Committee

Diverse committee with 17 members representing various interests:

- **Business Representatives**
- **Developers**
- **Residential property owners**
- **Commercial property owners**
- **Tax-exempt property owners**
- **Environmental groups**
- **City Councilors**
- **City staff**



14 Months of meetings, homework, consensus building



Committee Workplan

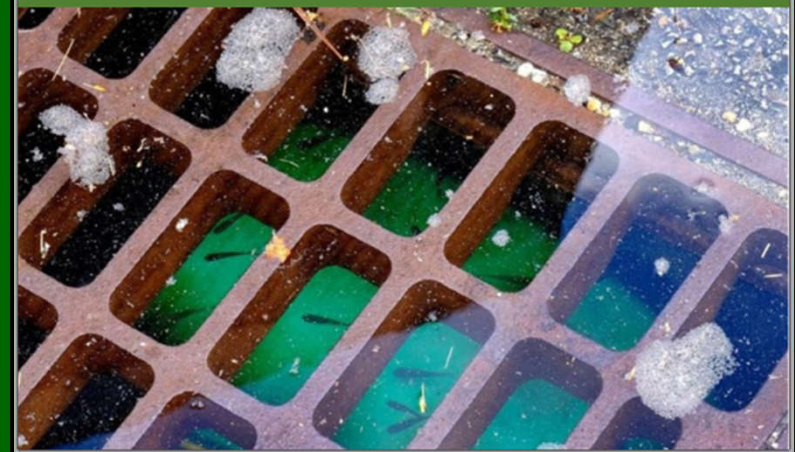
1. Review funding needs
2. Review funding options
3. Select a preferred funding option
 - Use shared values & homework assignments to come to consensus
4. Address technical, administrative, and logistical details of the preferred funding option

City of Dover, NH

Ad Hoc Committee to Study Stormwater and Flood Resilience Funding

Findings & Recommendations Report

January 2022



S.A.F.E.
**STORMWATER &
FLOOD
RESILIENCE
FUNDING**

Secure. Adequate. Flexible. Equitable



Funding Options Considered

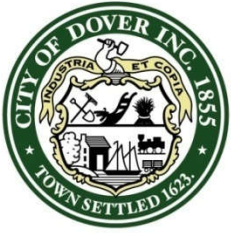
Funding Options

- General Fund
- Fee-based
- System Development Charges
- Stormwater Utility
- Sewer User Fees
- Village Districts
- Public-Private Partnerships
- Grants, Loans, and Bonds

Committee Homework Evaluation Criteria

- Primary vs. supplemental
- SAFE criteria
- Advantages and disadvantages
- Concerns/Questions

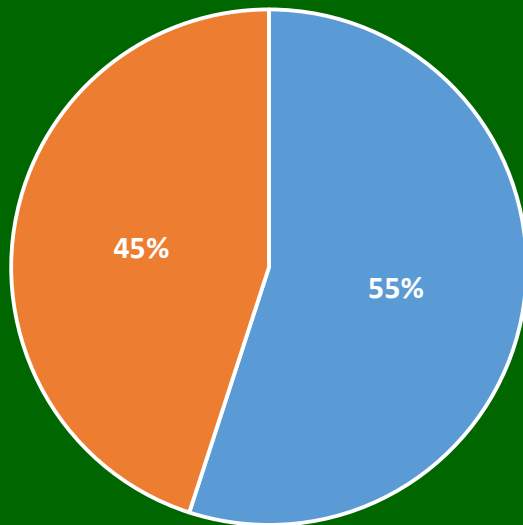




Stormwater & Flood Resiliency Utility

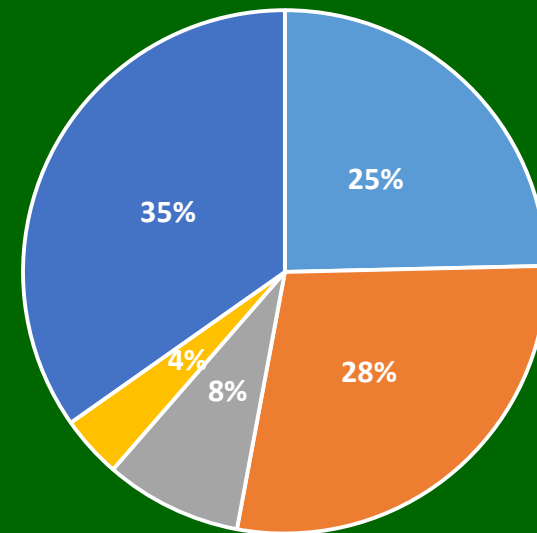
- Secure, Adequate, Flexible, Equitable (SAFE)
- User Fee Based vs Assessed Value Based
- Preliminary estimates have average residential unit to pay \$9/month

Revenue
Distribution from
Property Taxes



■ SFR ■ NSFR

Revenue
Distribution from
Utility Fee



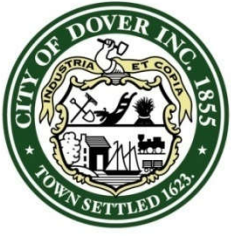
■ SFR ■ NSFR ■ Tax-Exempt ■ Municipal ■ Roads



Committee Recommendations

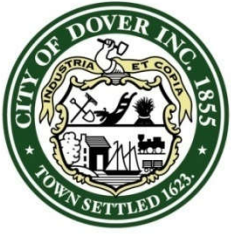
UNANIMOUS SUPPORT for the recommendation of a stormwater and flood resilience utility

- An equitable credit system that encourages on-site stormwater quantity and/or pollutant reductions is key to the success of a stormwater and flood resilience utility
- Public outreach, education, and involvement is paramount



Stormwater & Flood Resiliency Utility

- **February 2, 2022 – City Council voted 6 to 3 in favor of moving ahead with the development of a Stormwater Utility Ordinance, which would then be presented again for City Council vote**
- **No commitment has been made to adopt a utility**
- **Dover has secured \$100,000 grant for assistance in developing the utility**
- **Substantial Public Outreach and Involvement to come**



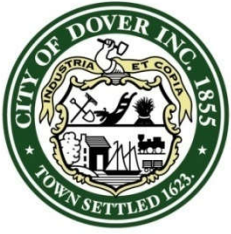
State Enabling Language

NH RSA Section 149-I-c

Criteria for Stormwater Utilities.-

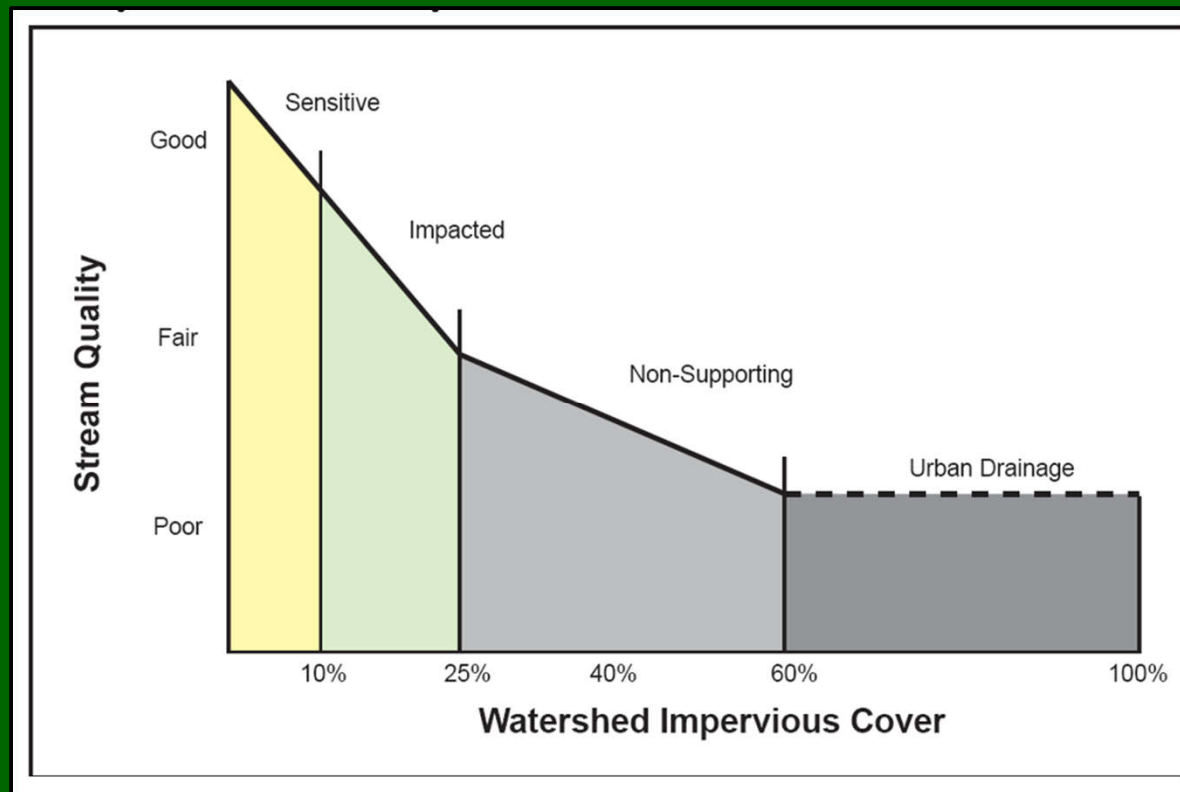
The stormwater utility shall address flood and erosion control, water quality management, ecological preservation, and annual pollutant load contained in stormwater discharge.

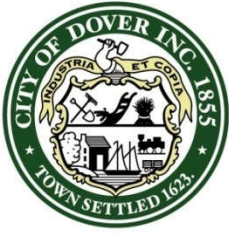
- I. Utilities may collect reasonable fees that are directly related to the cost of providing services.
- II. Properties charged assessments shall have equal opportunity to receive proportional benefit from the utility.
- III. The utility shall offer credits or fee abatements based on on-site management of water quality impairment or peak runoff storage, or both. The utility shall adopt design standards to determine the amount of abatement.
- IV. In assessing fees, the stormwater utility district shall forecast the annual cost of each component in the district's stormwater management program. This forecast shall be the basis for annual assessments distributed equally among the number of fee units within the district.
- V. A minimum assessment may be established for fee units based on single family residences. This equivalent residential unit (ERU) can serve as the fee unit basis for all fees. Government property and non-profit organizations shall be subject to the fee structure.
- VI. Boundaries of the district are not required to coincide with municipal boundaries.



Stormwater & Flood Resiliency Utility – Basic Summary

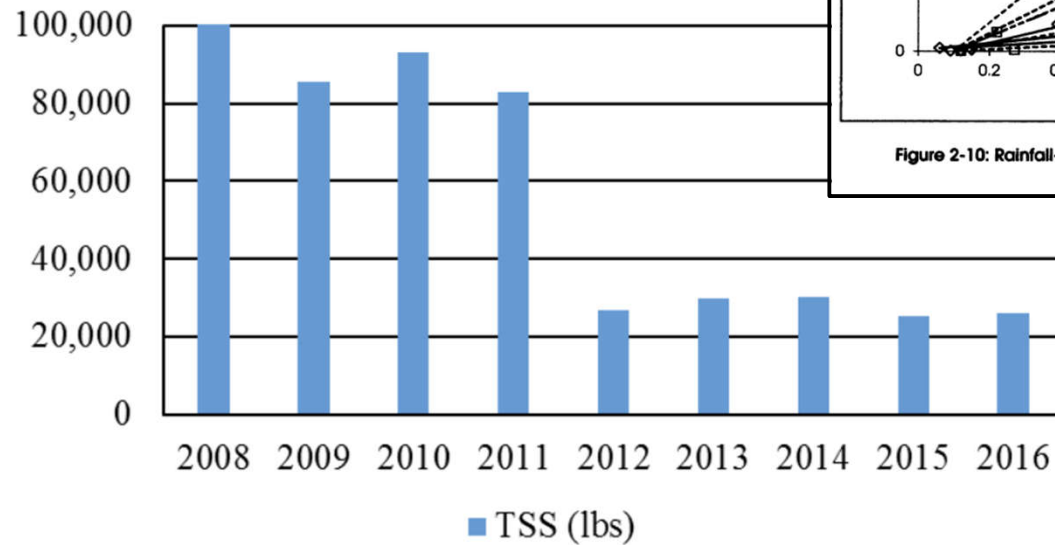
“Communities can use impervious surface cover as a proxy indicator for roughly comparing the relative impact of alternative development proposals on stormwater runoff and associated water pollution in local waterways.” EPA





Stormwater & Flood Resiliency Utility – Basic Summary

Mass Pollutant Export (lbs)



EIC Pre vs. Post (Roosevelt)

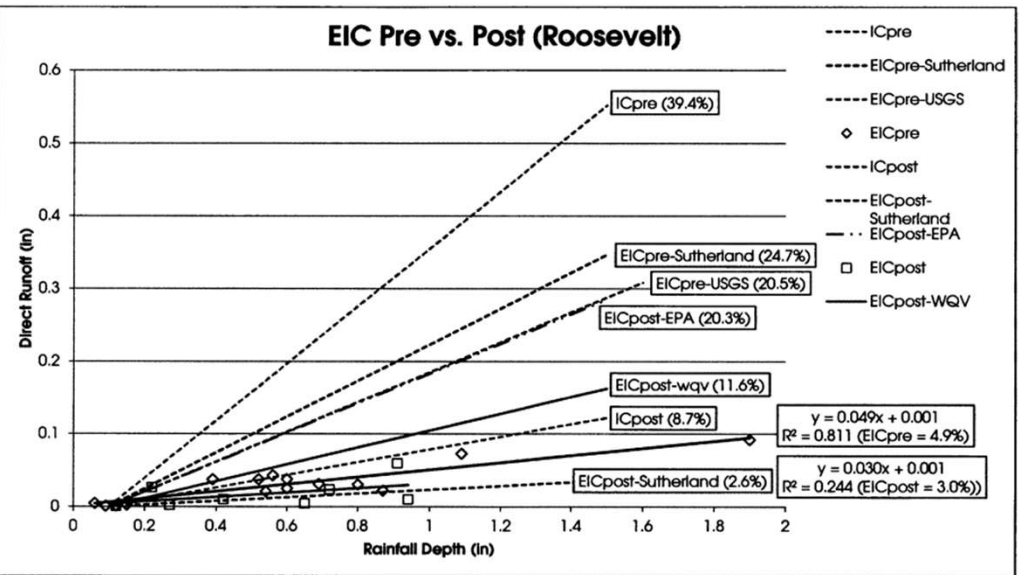
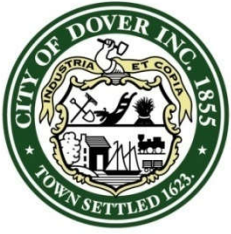


Figure 2-10: Rainfall-Runoff at BB-Upper Watershed (Roosevelt, DA = 46.4 acres) by Time Period



Stormwater & Flood Resiliency Utility – Basic Summary

Equivalent Residential Unit (ERU) - Median impervious area on typical residential property

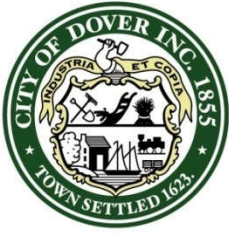
For Dover, 1 ERU = $\pm 3,500$ sq. ft.

Typical Residential Property
Impervious area: 3,500 sq. ft.
of ERUs = 1 ERU



Example Commercial Property
Impervious area: 17,150 sq. ft.
of ERUs = $17,150 / 3,500 = 5$ ERUs





Stormwater & Flood Resiliency Utility – Basic Summary

Examples of Structural Controls

Cisterns are storage devices used to collect rainwater from roof downspouts for later reuse. They provide the benefit of reduced stormwater runoff and conservation of water. Stormwater collected in cisterns can typically be reused for such purposes as irrigation of lawns and gardens, wash water and other non-potable uses.



Source: City of Portland, ME

Detention Ponds are impoundments designed to collect, detain and release stormwater runoff at a controlled rate. They provide treatment through the use of a permanent pool, which helps settle solids and associated pollutants.



Source: NHDES

Drywells are comprised of seepage tanks set in the ground and surrounded with stone and are designed to intercept and temporarily store stormwater runoff until it infiltrates into the soil. Dry wells are particularly well suited to receive rooftop runoff entering the tank via an inlet grate or direct downspout connection.



Source: City of Portland, ME

Infiltration chambers are structures designed to temporarily store runoff, allowing water to infiltrate into the ground. Treatment of runoff is provided by pollutants binding to soil particles beneath the chambers as water percolates into the subsurface.



Source: NHDES

Permeable pavers are an alternative to paved surfaces that can decrease stormwater runoff. Permeable pavers consist of permeable interlocking or grid concrete pavers underlain by a drainage layer, allowing stormwater runoff to pass in between the paver surface and into an underlying stone reservoir, where it is temporarily stored and allowed to infiltrate into the underlying soils.



Source: City of Portland, ME

Rain gardens are small, landscaped depressions that are filled with a mix of native soil and compost, and are planted with trees, shrubs and other garden-like vegetation. They are designed to temporarily store stormwater runoff and reduce runoff pollutant loads.



Source: NHDES

Note: This is not an exhaustive list. Other types of low impact development (LID) and green infrastructure could qualify for credits as well. Additional examples are listed in the [New Hampshire Homeowner's Guide to Stormwater Management](#).



Residential Credit Example

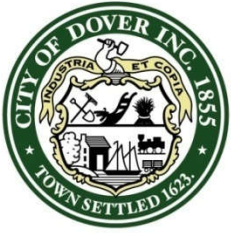
Total Impervious Area = 2,600 ft²

$2,600 \text{ ft}^2 / 1,200 \text{ ft}^2 = 2.17$

2.17 rounds to **2 Stormwater Billing Units**

Treated Impervious Area = 900 ft²

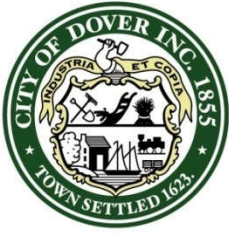
Credit = 0.5 SBU



Stormwater & Flood Resiliency Utility – Basic Summary

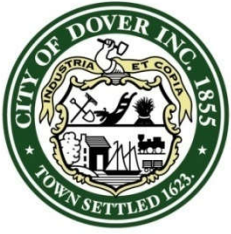
Common Rate Structures:

- **Flat fee:** A uniform fee is charged to all property owners
- **Tiered fee:** Properties are categorized into tiers based on amount of impervious cover
- **Proportional fee:** Fees are individually calculated for each property based on their specific impervious cover

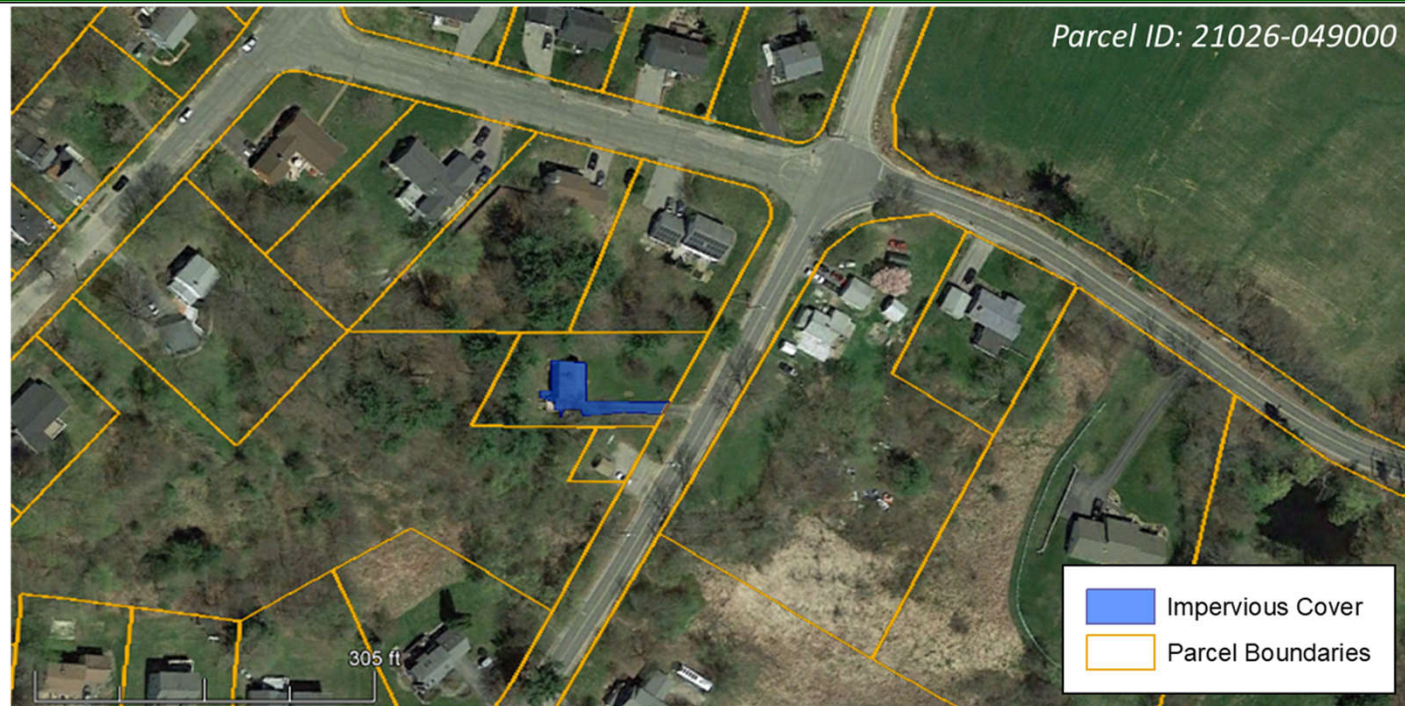


Stormwater & Flood Resiliency Utility – Basic Summary

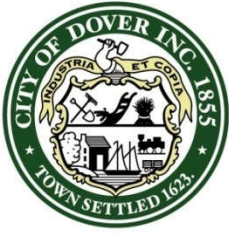
Credit Type	Credit Standards	Standards Met?	Portion of IC Treated to Standard	Credit Received
Basic Water Quality <i>Available credit: 50%</i>	Is runoff of impervious surfaces treated to provide 80% removal of total suspended solids, 50% removal of total nitrogen, and 50% removal of total phosphorus, as required within Dover's Site Development Design Criteria?	✓	100%	50%
Basic Water Quantity <i>Available credit: 10%</i>	Are stormwater conveyance practices sized appropriately to convey the 10-year, 24-hour storm event without overtopping or causing flooding on the property, as required within Dover's Site Development Design Criteria?	✓	100%	10%
Extra Water Quality <i>Available credit: up to 25%</i>	Is runoff of impervious surfaces treated to provide greater than 90% removal of total suspended solids, greater than 60% removal of total nitrogen, and greater than 60% removal of total phosphorus?	✗	0%	n/a
Extra Water Quantity <i>Available credit: up to 15%</i>	Are stormwater conveyance practices sized appropriately to convey the 25-year, 50-year, or 100-year 24-hour storm event without overtopping or causing flooding on the property?	✗	0%	n/a
Total Credit Received				60%



Stormwater & Flood Resiliency Utility – Basic Summary



- Estimated total impervious area: 2,337 sq. ft.
- Total ERUs = $2,337 \text{ sq. ft.} / 3,430 \text{ sq. ft.} = 0.68$, rounded to the nearest integer = 1 ERU
- Estimated annual utility fee to fund \$3.5 million Stormwater Program: **\$113**
- Estimated taxable value: \$308,500
- Estimated annual portion of property taxes to fund \$3.5 million Stormwater Program: **\$216**



Stormwater & Flood Resiliency Utility – Basic Summary



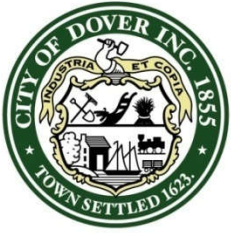
- Estimated total impervious area: 143,889 sq. ft.
- Total ERUs = 143,889 sq. ft./3,430 sq. ft. = 41.95, rounded to the nearest integer = 42 ERUs
- Estimated annual utility fee to fund \$3.5 million Stormwater Program: **\$4,733**
- Estimated taxable value: \$4,601,800
- Estimated annual portion of property taxes to fund \$3.5 million Stormwater Program: **\$3,242**



Stormwater & Flood Resiliency Utility – Basic Summary

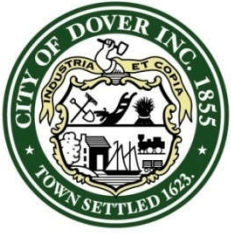


- Estimated total impervious area: 9,510 sq. ft.
- Total ERUs = 9,510 sq. ft./3,430 sq. ft. = 2.77, rounded to the nearest integer = 3 ERUs
- Estimated annual utility fee to fund \$3.5 million Stormwater Program: **\$338**
- Estimated taxable value: \$2,915,200
- Estimated annual portion of property taxes to fund \$3.5 million Stormwater Program: **\$2,054**



Next Steps:

- **Finalize grant funding and bring on a consultant**
- **Additional, in-depth analysis of funding needs and set Desired Funding Level**
- **Outline any additional staffing requirements for utility implementation**
- **Fully analyze fee structure options (pg. 23 of report)**
- **Fully analyze crediting system options (pg. 29 of report)**



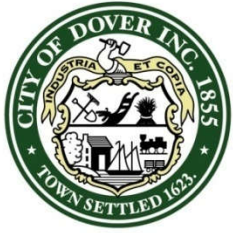
Next Steps:

Outreach & Education!!



Final Steps:

- **Dover Utilities Commission to review alternatives and information and Determine Recommended Fee Schedule and Credit System**
- **Ordinance Committee to take recommendations from DUC to Develop Recommended Ordinance**
- **Fall 2023 - Provide information to City Council for vote**



Stormwater and Flood Resiliency Utility Joint Workshop Dover Ordinance Committee Dover Utilities Committee

June 13, 2022

**Presentation By: Gretchen Young, PE
Environmental Projects Manager**