

## **Factsheet: City of New Haven Water Quality and Stormwater Summary**

This document was created for each town that has submitted monitoring data under the current Small Municipal Separate Storm Sewer System (MS4) General Permit. What follows is information on how stormwater can affect water quality in streams and rivers and a summary of data submitted by your town. This factsheet is intended to help you interpret your monitoring results and assist you in compliance with the MS4 program.

### Water Quality in Connecticut

Surface waters are important resources that support numerous uses, including water supply, recreation, fishing, shellfishing and sustaining aquatic life. Water quality conditions needed to support these uses are identified within the Connecticut Water Quality Standards (WQS). In order to protect and restore these uses, we need acceptable environmental conditions (physical, chemical and biological) to be present within surface waters.

To assess and track water quality conditions, CT DEEP conducts monitoring across the State. The data is synthesized into a biennial state water quality report called the Integrated Water Quality Report. Currently, specific water quality monitoring in the state encompasses about 50% of rivers, 47% of lakes, and 100% of estuary/coastline. In addition, CT DEEP may have information about certain land uses or discharges which could indicate a potential for water quality to be impacted, even if the waterbody has not been fully monitored and assessed.

To find more detailed information on water quality in your town, please see the Integrated Water Quality Report (IWQR) on the CT DEEP website at [www.ct.gov/deep/iwqr](http://www.ct.gov/deep/iwqr). Information on water quality within your town is also presented on the maps included in this fact sheet.

### Impacts of Impervious Cover on Water Quality

Impervious cover (IC) refers to hard surfaces across the landscape such as roads, sidewalks, parking lots and roofs. Studies have focused on the amount of hard surfaces to evaluate the impacts of stormwater runoff from these hard surfaces on water quality and found that IC affects both the quantity and quality of stormwater. IC forces rain to runoff the land, carrying pollutants quickly and directly to lakes and streams instead of soaking into the ground and being filtered by the soil. For more information on impervious cover, please see the CT DEEP web page [www.ct.gov/deep/imperviouscoverstudies](http://www.ct.gov/deep/imperviouscoverstudies) and EPA's web page [www.epa.gov/caddis/ssr\\_urb\\_isl.html](http://www.epa.gov/caddis/ssr_urb_isl.html).

In general, the higher the percentage of IC in a watershed, the poorer the surface water quality. Research in Connecticut strongly suggests that aquatic life will be harmed when the IC within a

watershed exceeds 12%. Stormwater pollution from IC is a likely cause of impairment for these waterbodies.

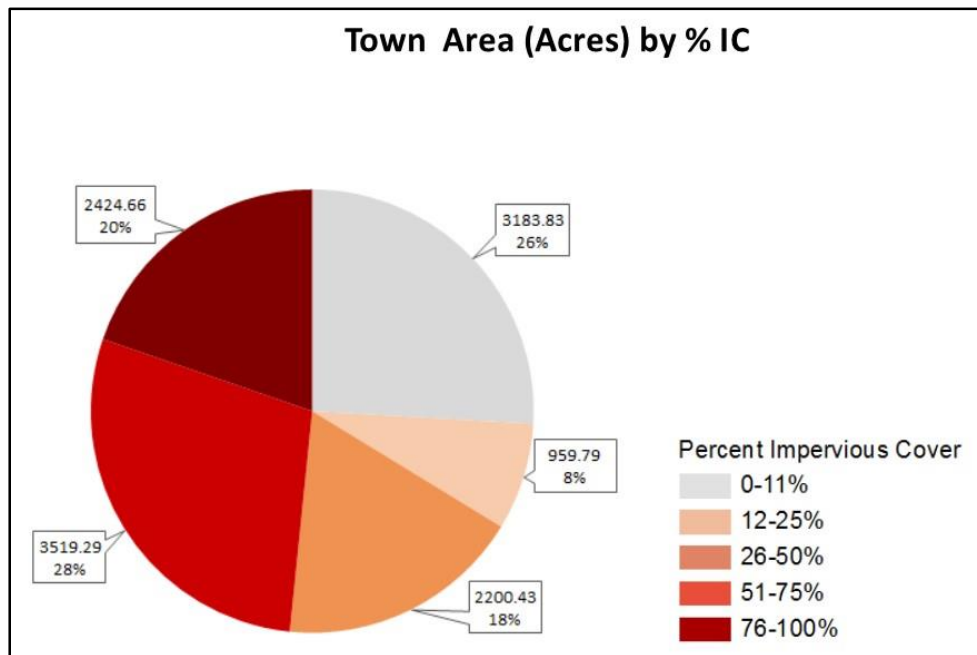
### City of New Haven: Impervious Cover Data

This chart shows the amount of area within your town that contains IC. Data is grouped by acres and percent IC. While all levels of IC can contribute stormwater to streams, it is important to note that land with IC greater than 12% in town is likely to be contributing enough stormwater to streams to have a negative impact on water quality.

Towns should aim to make stormwater improvements in areas with IC greater than 12% in an effort to reduce the amount of stormwater pollution reaching surface waters which will protect and improve water quality.

For more information on areas of impervious cover within your town, please see the maps at the back of this factsheet.

Amounts of Impervious Cover within the City of New Haven



### Pollution Reduction

Waterbodies often can handle a certain amount of pollutants and still maintain good water quality. However, impaired waterbodies have too much pollution impacting their water quality and therefore the streams do not support all uses for the waterbody. Total Maximum Daily Loads (TMDLs) are pollution reduction budgets developed for impaired waterbodies in order to meet water quality. If the pollution budget is achieved through the recommended pollution reduction

measures, then the waterbody is expected to meet water quality. CT DEEP also supports impaired waters restoration through watershed based plans ([www.ct.gov/deep/watershed](http://www.ct.gov/deep/watershed)) which provide more specific non-point source pollution control measures. The following TMDLs or pollution reduction strategies have been developed and apply to areas within your town.

TMDLs or Strategies Applicable to the City of New Haven

<b>Name of TMDL or Strategy</b>	<b>Pollutant</b>	<b>Waterbody Name</b>	<b>Link</b>
Statewide Bacteria TMDL	Bacteria	West River / Edgewood Park Pond	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/westriver5305.pdf">www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/westriver5305.pdf</a>
Statewide Bacteria TMDL	Bacteria	Mill River / Shepard Brook	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/millriver5302.pdf">www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/millriver5302.pdf</a>
Statewide Bacteria TMDL	Bacteria	Estuary 6: New Haven	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/estuary6newhaven.pdf">www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/estuary6newhaven.pdf</a>
A TMDL Analysis for the Quinnipiac River Regional Basin	Bacteria	Harbor Brook / Misery Brook / Quinnipiac River / Sodom Brook	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/quinnipiac_tmdl_final.pdf">www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/quinnipiac_tmdl_final.pdf</a>
A TMDL Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound	Nitrogen	Long Island Sound and contributing watersheds	<a href="http://www.ct.gov/deep/lib/deep/water/lis_water_quality/nitrogen_control_program/tmdl.pdf">www.ct.gov/deep/lib/deep/water/lis_water_quality/nitrogen_control_program/tmdl.pdf</a>
Northeast Regional Mercury TMDL	Mercury	All CT Inland waters	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/ne_hg_tmdl.pdf">www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/ne_hg_tmdl.pdf</a>
Interim Phosphorus Reduction Strategy	Phosphorus	Certain CT Inland waters	<a href="http://www.ct.gov/deep/lib/deep/water/water_quality_standards/p/interimmgntphosstrat_042614.pdf">www.ct.gov/deep/lib/deep/water/water_quality_standards/p/interimmgntphosstrat_042614.pdf</a>

For more information on these TMDLs or strategies please go to our website [www.ct.gov/deep/tmdl](http://www.ct.gov/deep/tmdl).

## Stormwater Quality Monitoring

Regular monitoring for targeted pollutants in stormwater provides an indication of potential for water quality impacts and helps identify sources and unlawful discharges. Annual monitoring at 6 locations from different areas of town has been a requirement of the MS4 permit since 2004. CT DEEP uses that information to evaluate the quality of stormwater and the potential for impacts to surface waters as well as to make sure that stormwater is managed properly.

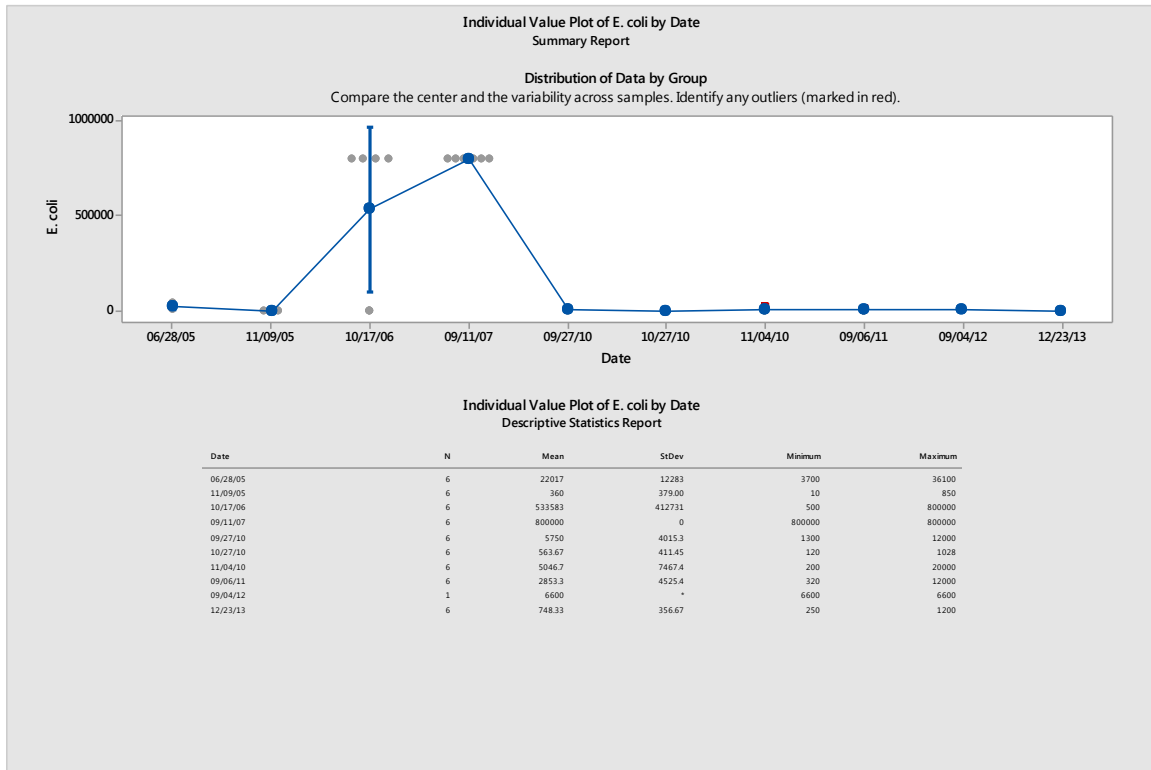
Below are 5 graphs tracking stormwater results submitted by your town for 5 parameters reported under the current MS4 General Permit. The results of each stormwater test submitted to CT DEEP by your town is shown. Individual sample results are shown in grey while the average of the samples collected on a particular day is shown in blue, with a line connecting the averages for the various sample dates. The bars show the statistical range of samples for each day with the red squares showing results which are considered to be outliers, that is, very different from the other samples collected on that day. The chart on the graph lists the sample dates and some basic statistics:

<b>Statistic</b>	<b>Description</b>
N	Number of stormwater samples collected on that date
Mean	Average of the results reported for that sample date
Standard Deviation (StdDev)	A measure of the variability of the results for the sample date
Minimum	The lowest sample result for the sample date
Maximum	The highest sample result for the sample date

## Bacteria

*Escherichia coli* (*E. coli*) is a bacteria that lives in the intestines of humans and other warm-blooded animals and is used to indicate the presence of fecal matter in surface waters. Some strains of *E. coli* and other pathogens found in fecal material cause serious illness in people coming in contact with it. For this reason, high amounts of bacteria will cause authorities to close beaches for swimming. Bacteria is measured as the number of colony forming units, or CFU, per 100 ml of water. Any result that was reported as “to numerous to count” is included on the chart as 800,000 CFU/100 mL.

Results of annual stormwater monitoring under MS4 permit for *E.coli* (CFU/ 100 mL of sample)  
City of New Haven

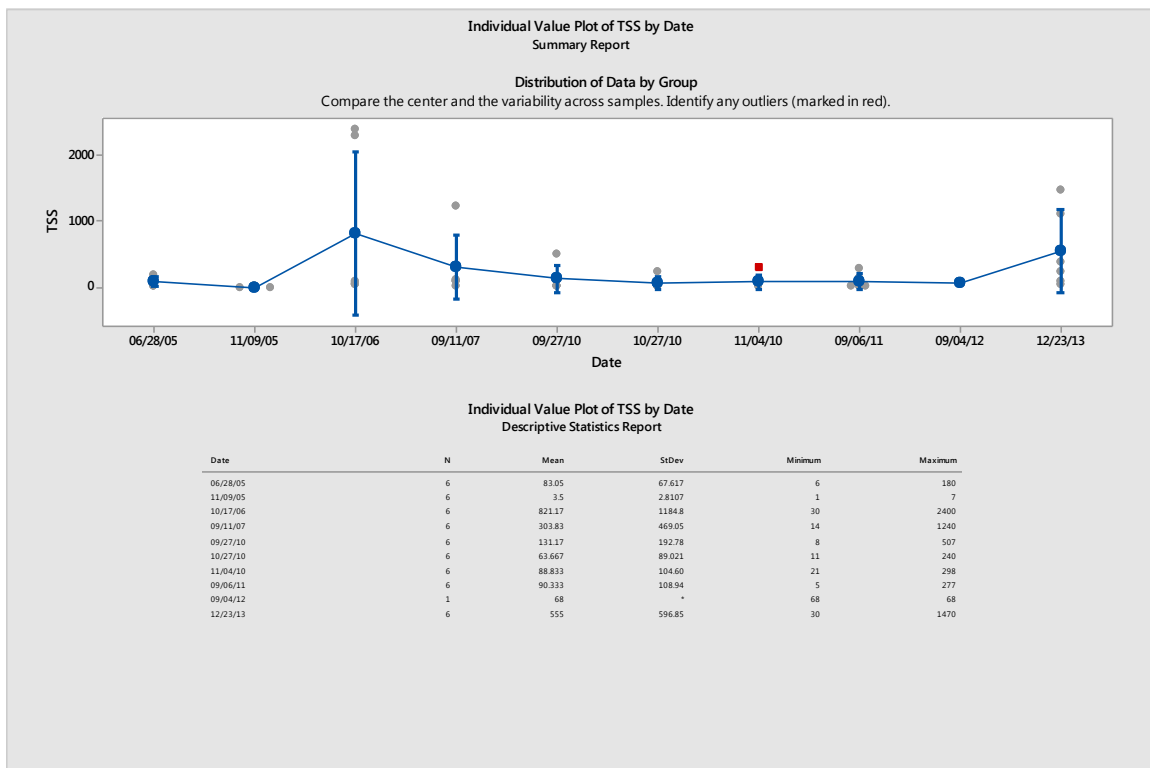


To support recreational uses of surface waters, the CT DEEP Water Quality Standards indicate that the average amount of *E. coli* found in a freshwater water body should be less than 126 CFU/100 mL and that a single sample tested for *E. coli* should be less than 235 CFU/100 mL at a designated swimming area and less than 410 CFU/100 mL in other areas. Monitoring for *E. coli* is currently required in the MS4 permit. Enterococci is another bacteria used to indicate the presence of fecal material in salt water environments. For recreation in salt water the Water Quality Standards indicate that average amount of Enterococci should be less than 35 CFU/100 mL in a designated swimming area and that a single sample tested for Enterococci should be less than 104 CFU/100 mL and in all other areas less than 500 CFU/100 mL. These targets have been included in the statewide bacteria TMDLs. In the Draft MS4 permit, *E.coli* results higher than 235 CFU/100 mL at a designated swimming area or greater than 410 CFU/100 mL in other areas requires a follow-up investigation. Individual stormwater sample results that exceed the applicable single sample maximum value for bacteria could impact water quality, so the associated outfalls should be evaluated for additional stormwater management.

## Total Suspended Solids

Total Suspended Solids (TSS) is a measurement of the amount of solids (including sand and silt) found in the stormwater sample. High concentrations of TSS can lower water quality in the receiving stream by transporting various pollutants to the waterbody where they can directly affect aquatic life or affect aquatic life by absorbing light, reducing photosynthesis, and by making the water warmer. TSS can also clog fish gills and smother fish eggs and suffocate the organisms that fish eat. TSS comes from erosion and is found in agricultural, urban and industrial runoff. TSS can be reduced by protecting land from erosion and allowing stormwater time to settle before discharging to surface waters.

### Results of annual stormwater monitoring under the MS4 general permit for TSS (mg/L) City of New Haven

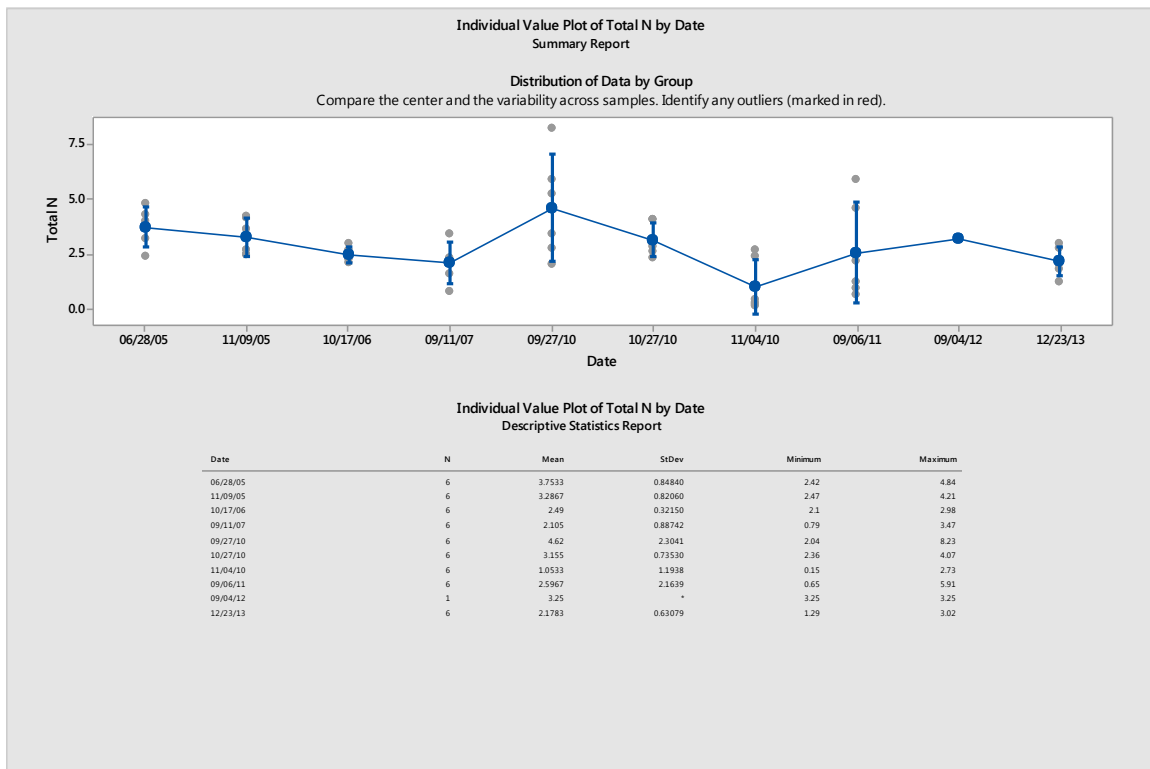


Currently, there is not a water quality based target for TSS in stormwater but TSS is a general indicator of water quality and, lower amounts of TSS are better. For comparison purposes, the average MS4 stormwater result reported for TSS by all towns covered by this permit is 48 mg/L. Areas within your town which have elevated TSS may be places to consider additional stormwater management efforts.

## Total Nitrogen

Nitrogen is an important nutrient in marine and estuarine waters such as Long Island Sound, as well as a concern in fresh water lakes and rivers. High amounts of nitrogen can lead to excessive growth of water plants and algae which then reduces the amount of oxygen available to living things in these waters. Unlawful discharges, animal waste, failing septic systems, leaves, litter and fertilizers are common sources of high nitrogen in stormwater. Responsible use of fertilizers, maintaining septic systems and proper disposal of pet waste will help reduce nitrogen in stormwater.

### Results of annual stormwater monitoring under MS4 general permit for total nitrogen (Total N mg/L) City of New Haven

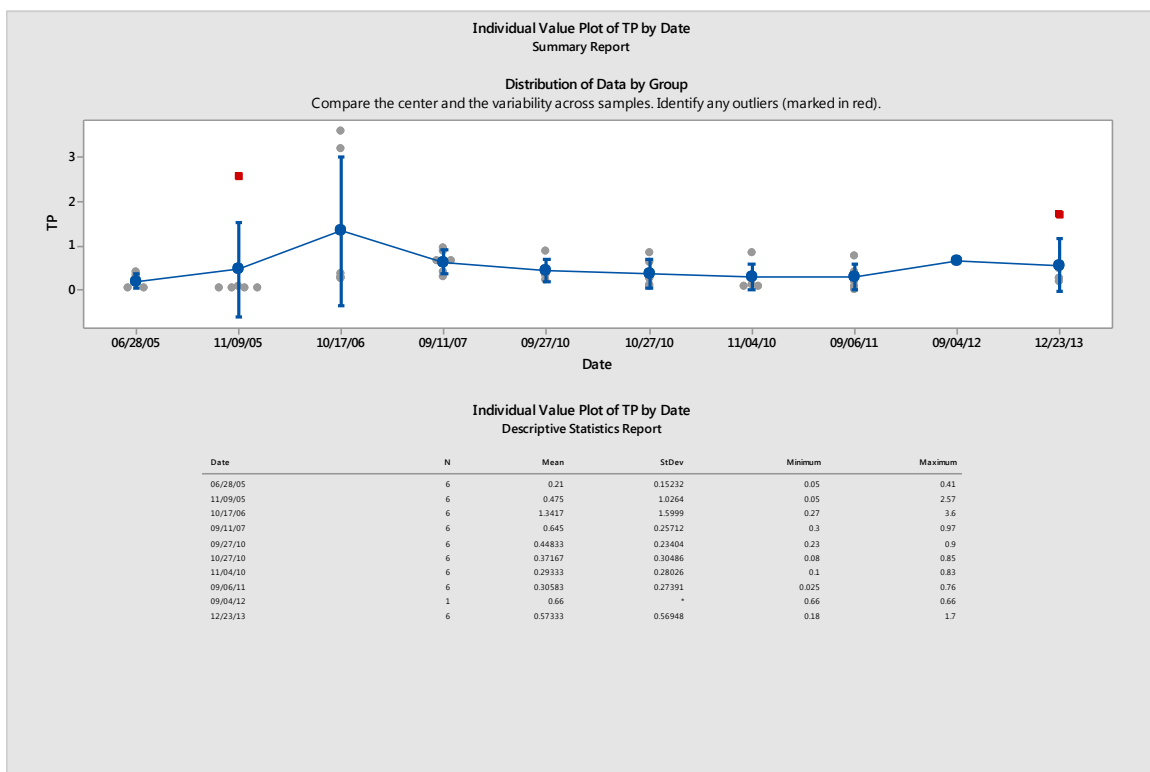


The TMDL for Long Island Sound requires a 10% reduction of nitrogen in stormwater discharges to prevent low oxygen conditions in Long Island Sound. Each town should be working to reduce the amount of nitrogen in their stormwater to address this issue. Under the current draft MS4 permit, any result for total nitrogen greater than 2.5 mg/L will require a follow-up investigation. Areas within your town which have elevated nitrogen may be places to consider additional stormwater management activities.

## Total Phosphorus

Phosphorus is an important nutrient necessary for growth in plants and animals in freshwater. Too much phosphorus in the water can throw off the balance of aquatic ecosystems causing excessive growth of water plants and algae blooms, which reduces the amount of oxygen in the water, potentially harming the fish. Sometimes these algae blooms can contain toxic forms of algae which are harmful to people and animals that come into contact with it. Sources of high phosphorus can be unlawful discharges, fertilizers, litter, leaves, erosion and animal waste.

### Results of annual stormwater monitoring under MS4 permit for total phosphorus (mg/L) City of New Haven



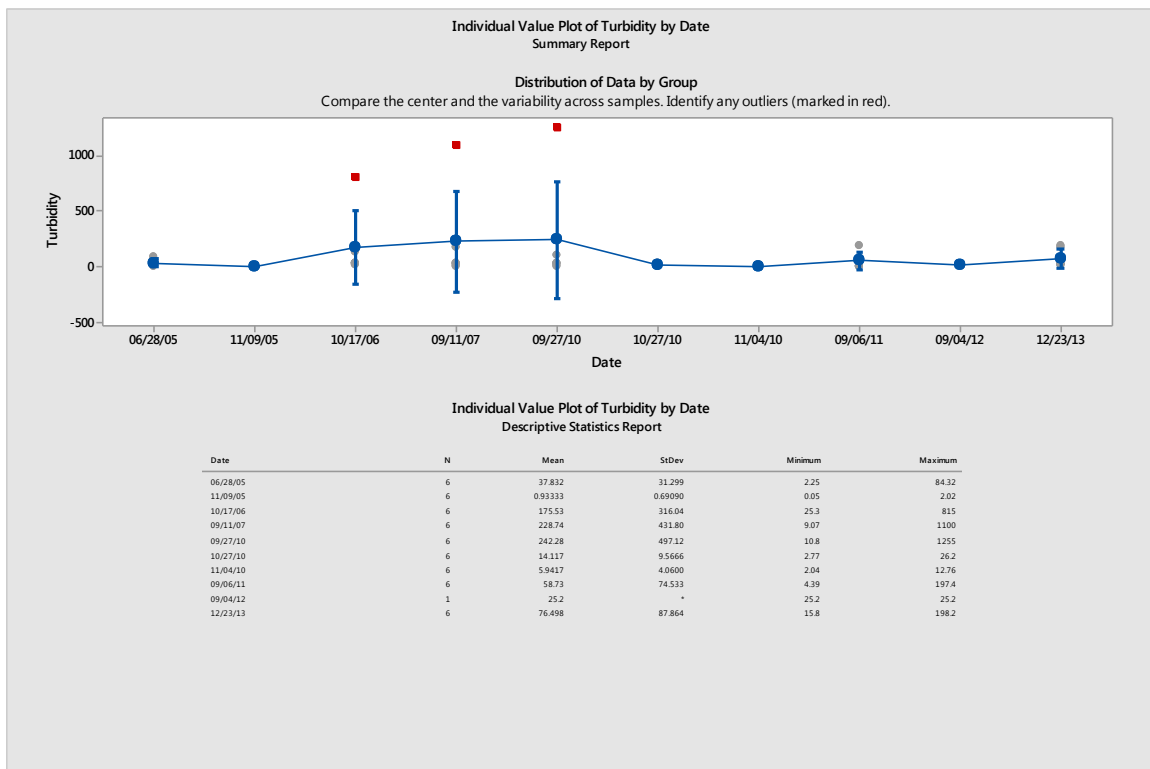
CT DEEP is actively working with many towns to reduce the amount of phosphorus reaching Connecticut's streams and rivers. Under the current draft MS4 permit, a total phosphorus result greater than 0.3 mg/L will require a follow-up investigation. Areas of your town that have elevated levels of phosphorus in the stormwater are good places to develop additional stormwater controls.



## Turbidity

Turbidity measures the clarity of the stormwater sample. It measures how much material (soil, algae, pollution, microbes etc.) is suspended in the sample. High turbidity lowers the water quality of a surface water by blocking sunlight for the plants and makes food harder for the fish to find and may be an indication of a higher amounts of other pollution in the water. Surface waters with high turbidity are visually less appealing for recreational use. High turbidity can be caused by erosion, failing septic systems, decaying plants or animals, and excessive algae growth. Turbidity is reported in Nephelometric Turbidity Units (NTU) which is related to how easily light passes through the water sample.

### Results of annual stormwater monitoring under MS4 permit for turbidity (NTU) City of New Haven



The Water Quality Standards have a criterion that indicates turbidity should not to exceed 5 NTU above ambient levels. In the draft MS4 permit, a turbidity result greater than 5 NTU over in-stream conditions will require a follow-up investigation. While there is not a fixed statewide criterion for turbidity, lower results are better for the health of the surface waters in town. Areas with higher levels of turbidity in stormwater would be a good place to develop additional stormwater controls.

## Town Maps

The following maps were created to show the impervious cover (IC) in your town as well as the water quality in the rivers, streams, lakes and estuaries in and around your town.

### *Impervious Cover on the Town Maps*

IC is shown in red on the maps. Dark red areas indicate a higher percentage of IC, lighter red areas have less IC, while the grey areas indicate very little or no IC.

### *Water Quality on the Town Maps*

Separate maps are provided for the different uses of the waterbodies such as Aquatic Life Uses, Recreation, and Shellfishing (in coastal towns). The waterbodies are colored to show the health of the waterbody. Green means that the waterbody meets the water quality requirements to fully support the specified use. Yellow means that water quality is poor and that the specified use is not met. Blue means that there is not enough information to know whether or not water quality is good or bad to support the specified use. Additionally, a small map is provided on the left side of each larger map to show which watersheds are within your town.

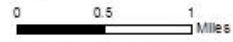
# Waters Designated For Aquatic Life in the Town of New Haven

Percent Impervious Cover	Designated For Aquatic Life
0-11%	Fully Supporting
12-25%	Not Supporting
26-50%	Unassessed
51-75%	
76-100%	

## Subregional Basins

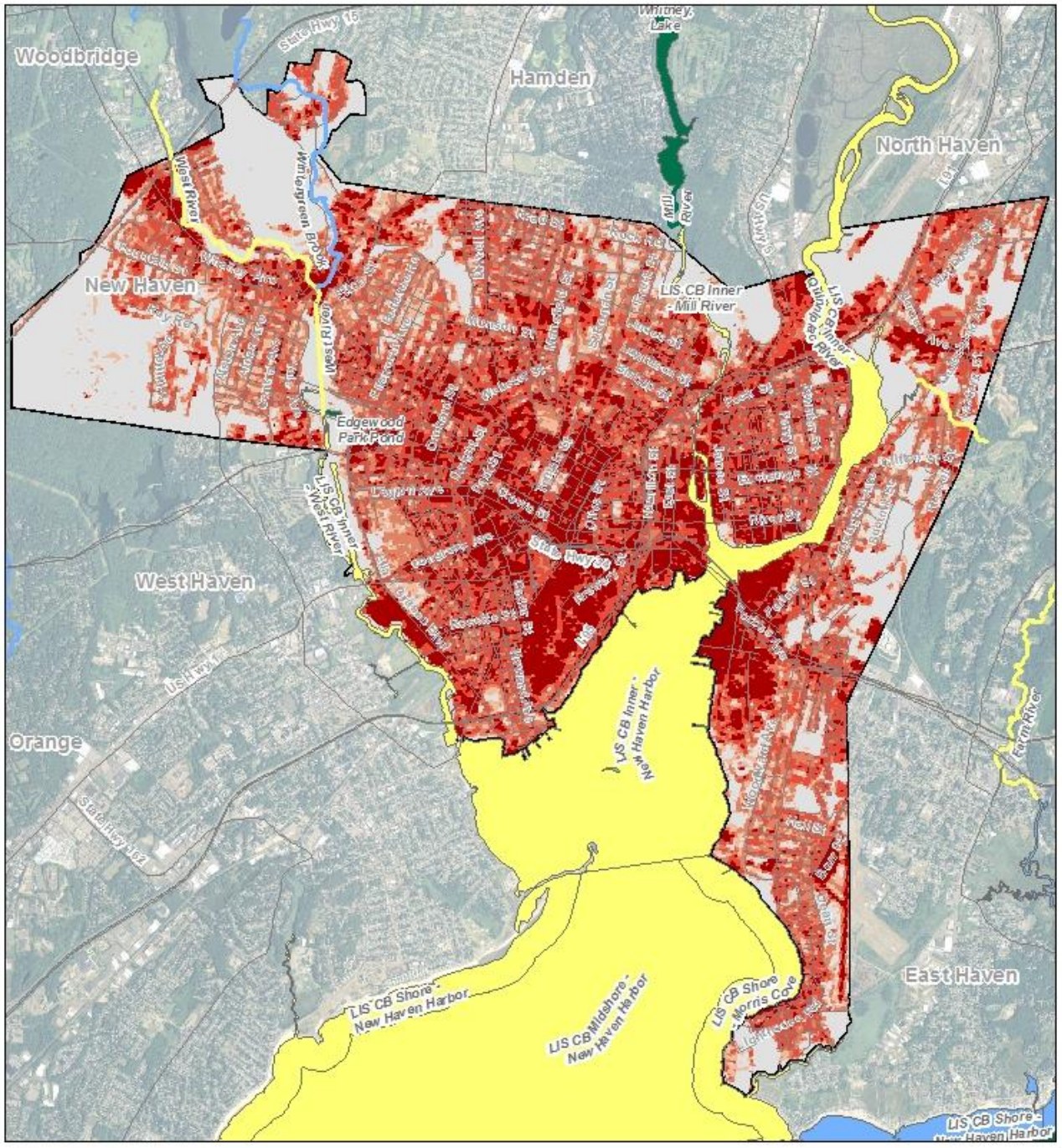


Indian River	South Central Shoreline
Mill River	West River
Quinnipiac River	Wintergreen Brook

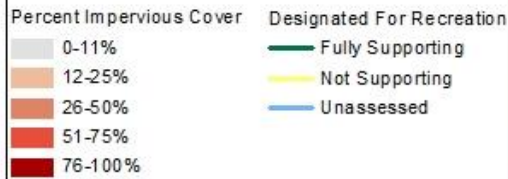


These maps were created using the National Land Cover Database (NLCD) 2011 Impervious Cover Percent Data. For more detail please review the metadata document.

Impervious cover (IC) refers to hard surfaces across the landscape such as pavement or buildings. These hard surfaces do not absorb water and prevent rain from soaking in to the ground. As a result, runoff occurs and easily carries pollutants to nearby lakes and streams.



## Waters Designated For Recreation in the Town of New Haven



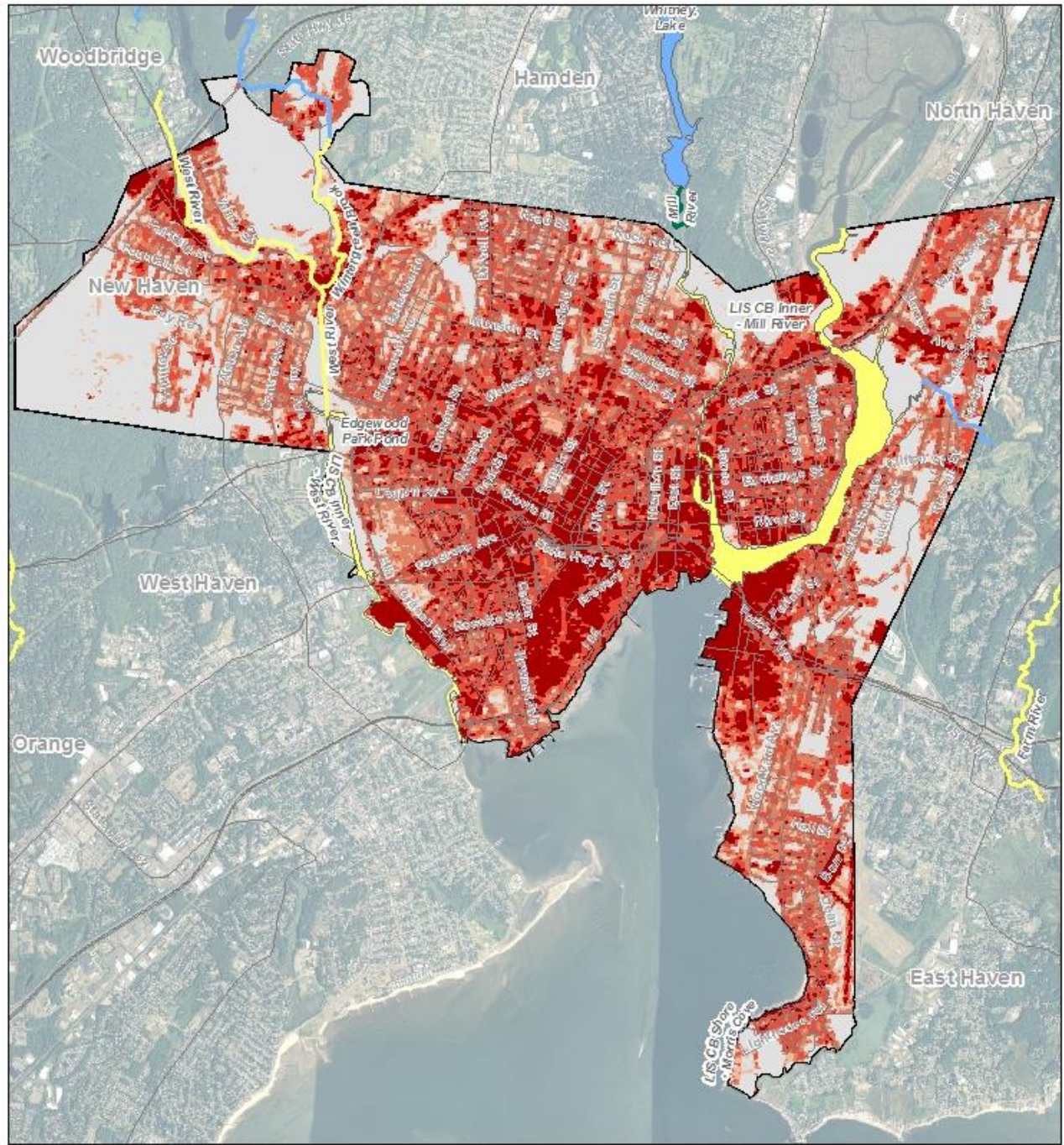
### Subregional Basins



0 0.5 1 Miles

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# Waters Designated For Shellfishing in the Town of New Haven

Percent Impervious Cover	Designated For Shellfishing
0-11%	Fully Supporting
12-25%	Not Supporting
26-50%	Unassessed
51-75%	
76-100%	

## Subregional Basins



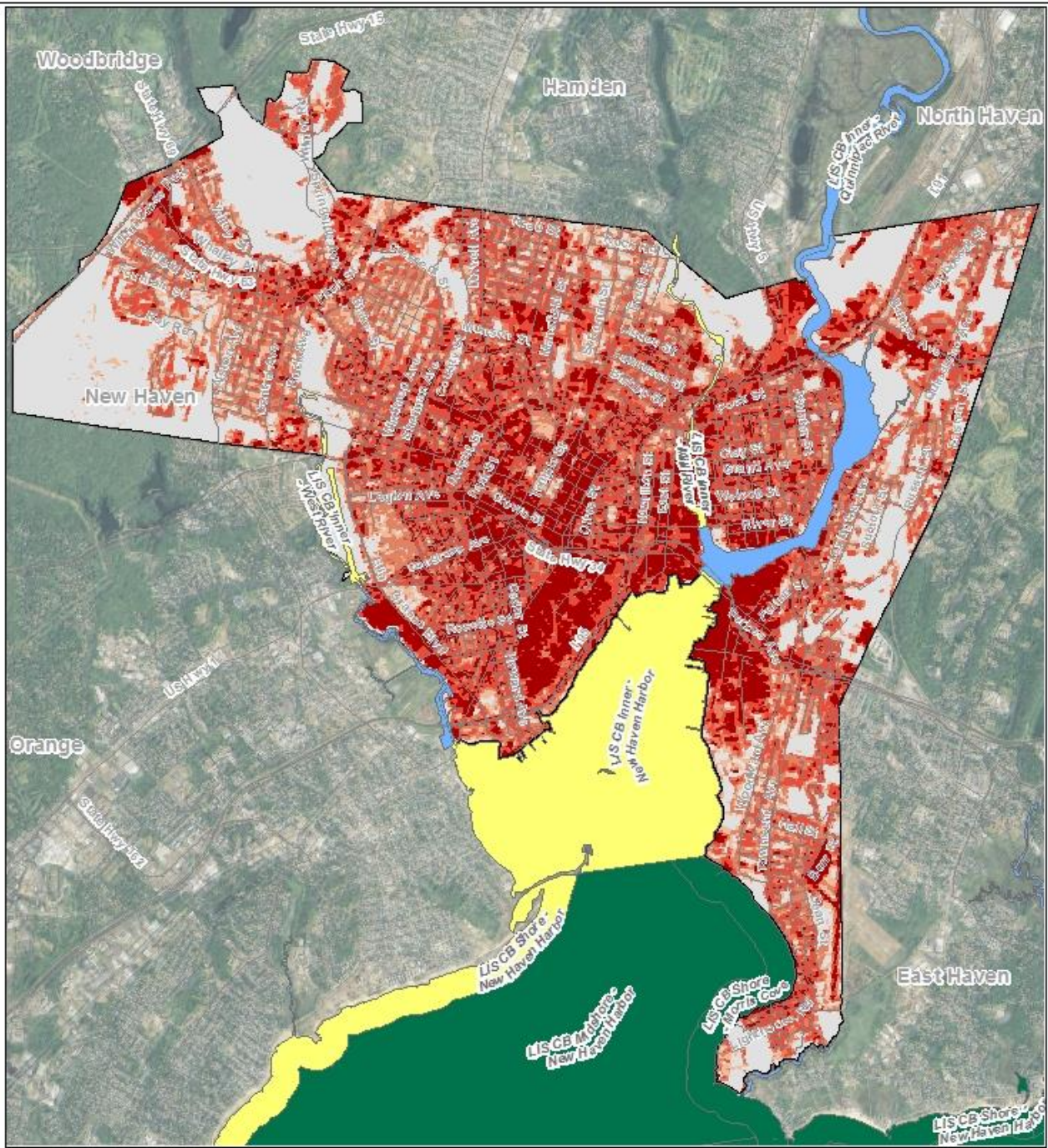
Indian River	South Central Shoreline
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## **Factsheet: City of New London Water Quality and Stormwater Summary**

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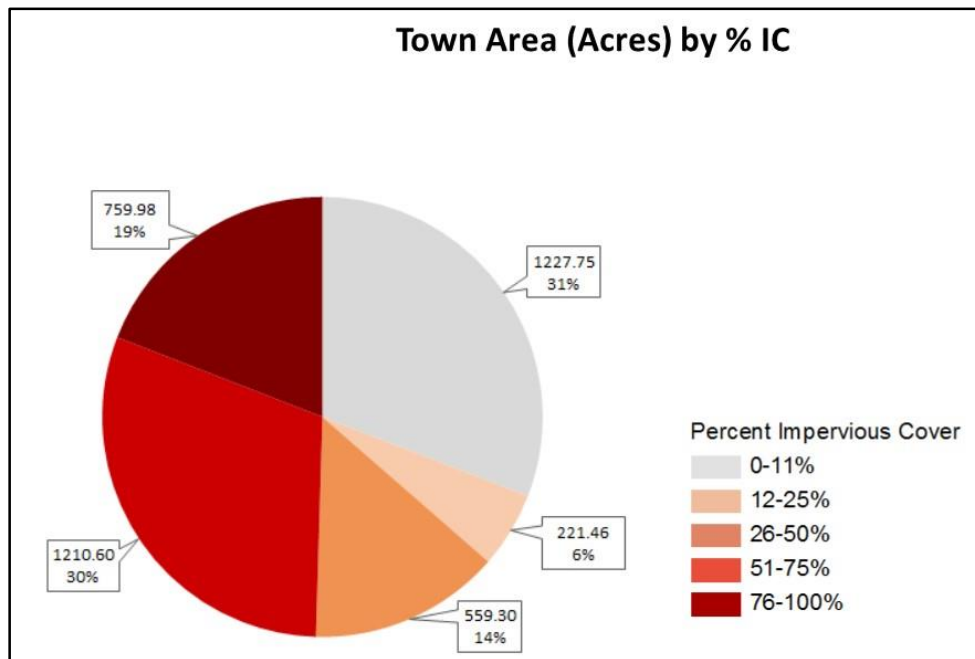
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Amounts of Impervious Cover within the City of New London



### Pollution Reduction

Waterbodies often can handle a certain amount of pollutants and still maintain good water quality. However, impaired waterbodies have too much pollution impacting their water quality and therefore the streams do not support all uses for the waterbody. Total Maximum Daily Loads (TMDLs) are pollution reduction budgets developed for impaired waterbodies in order to meet water quality. If the pollution budget is achieved through the recommended pollution reduction

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<b>Name of TMDL or Strategy</b>	<b>Pollutant</b>	<b>Waterbody Name</b>	<b>Link</b>
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Statewide Bacteria TMDL	Bacteria	Estuary 11: New London / Groton	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/estuary11newlondon_groton.pdf">www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/estuary11newlondon_groton.pdf</a>
Statewide Bacteria TMDL	Bacteria	Thames River / Flat Brook	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/thamesflatbrook3000.pdf">www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/thamesflatbrook3000.pdf</a>
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Northeast Regional Mercury TMDL	Mercury	All CT Inland waters	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/ne_hg_tmdl.pdf">www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/ne_hg_tmdl.pdf</a>
Interim Phosphorus Reduction Strategy	Phosphorus	Certain CT Inland waters	<a href="http://www.ct.gov/deep/lib/deep/water/water_quality_standards/p/interimmgntphosstrat_042614.pdf">www.ct.gov/deep/lib/deep/water/water_quality_standards/p/interimmgntphosstrat_042614.pdf</a>

For more information on these TMDLs or strategies please go to our website [www.ct.gov/deep/tmdl](http://www.ct.gov/deep/tmdl).

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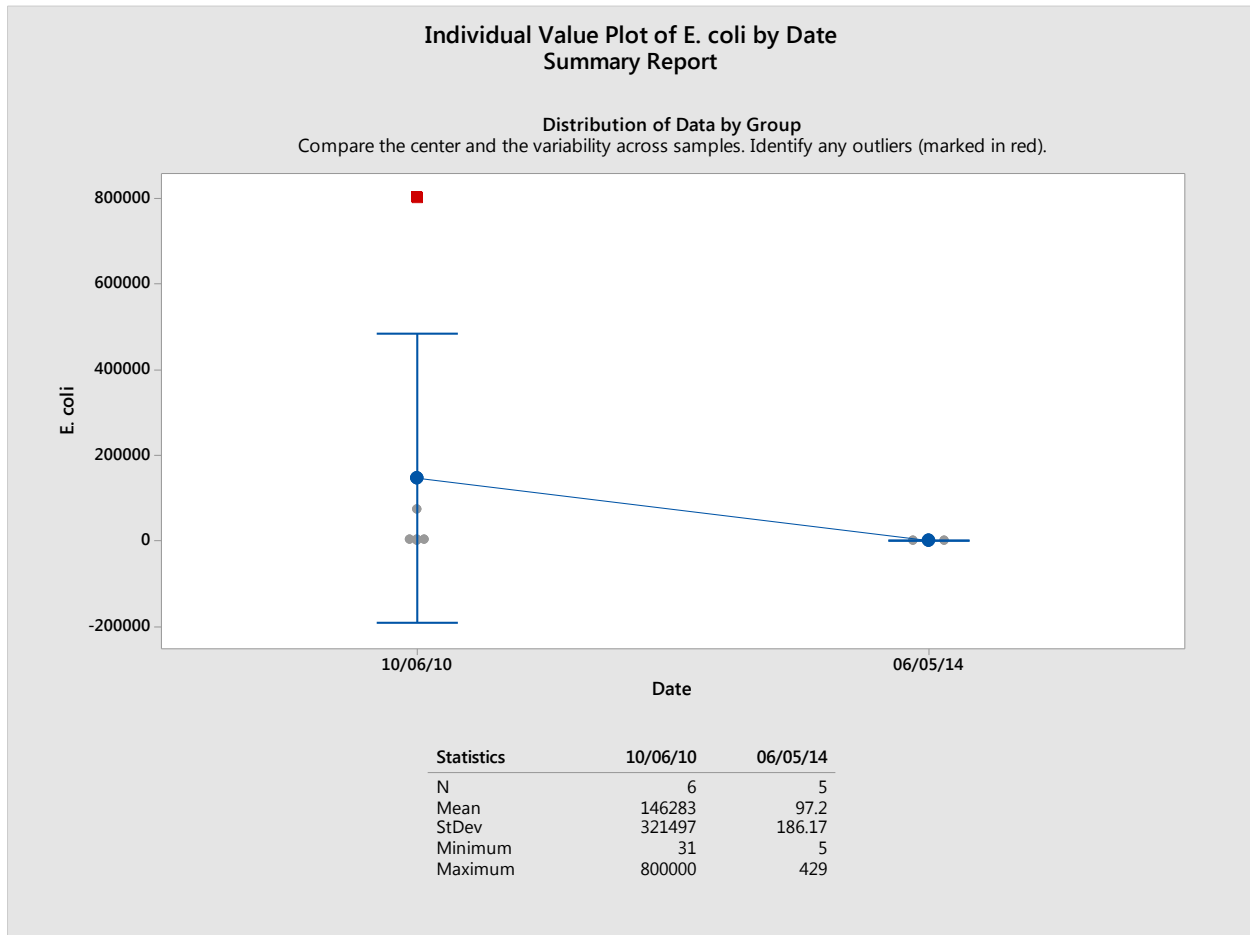
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### Bacteria

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Results of annual stormwater monitoring under MS4 permit for *E.coli* (CFU/ 100 mL of sample)  
City of New London

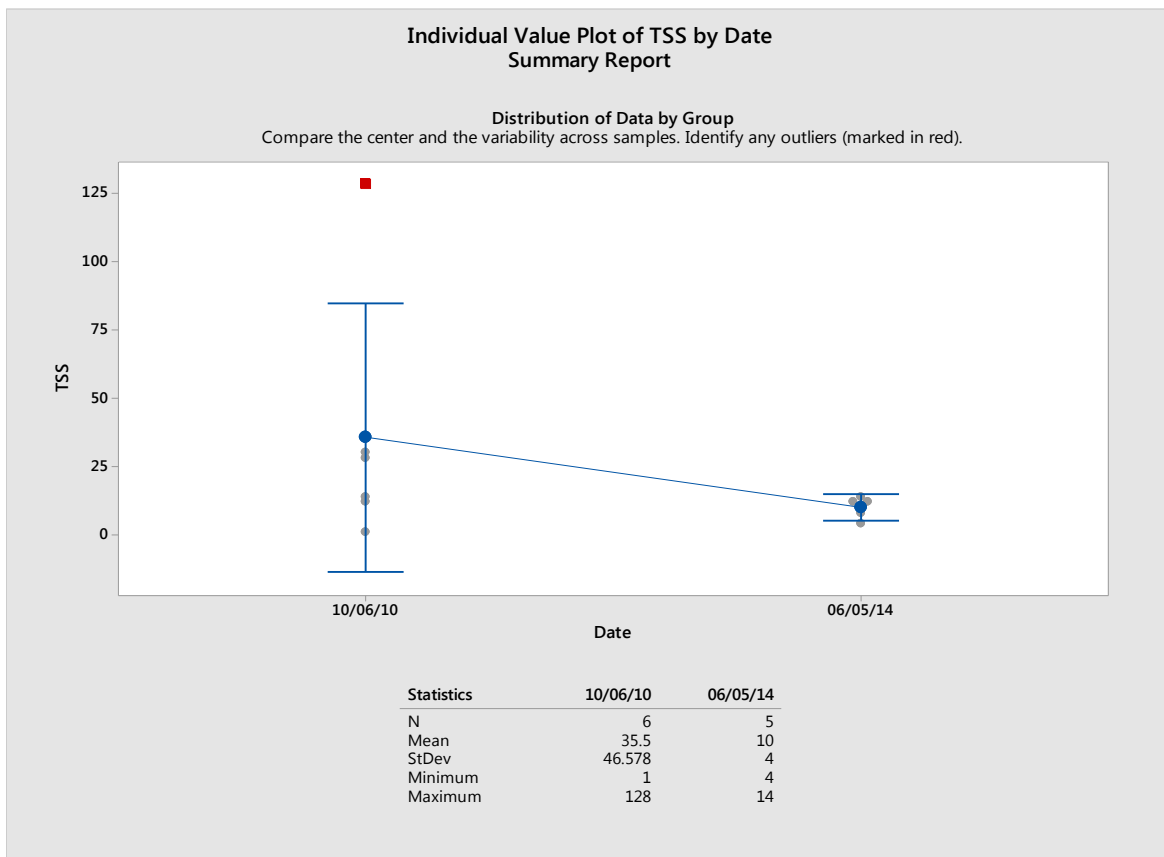


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## Total Suspended Solids

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### Results of annual stormwater monitoring under the MS4 general permit for TSS (mg/L) City of New London

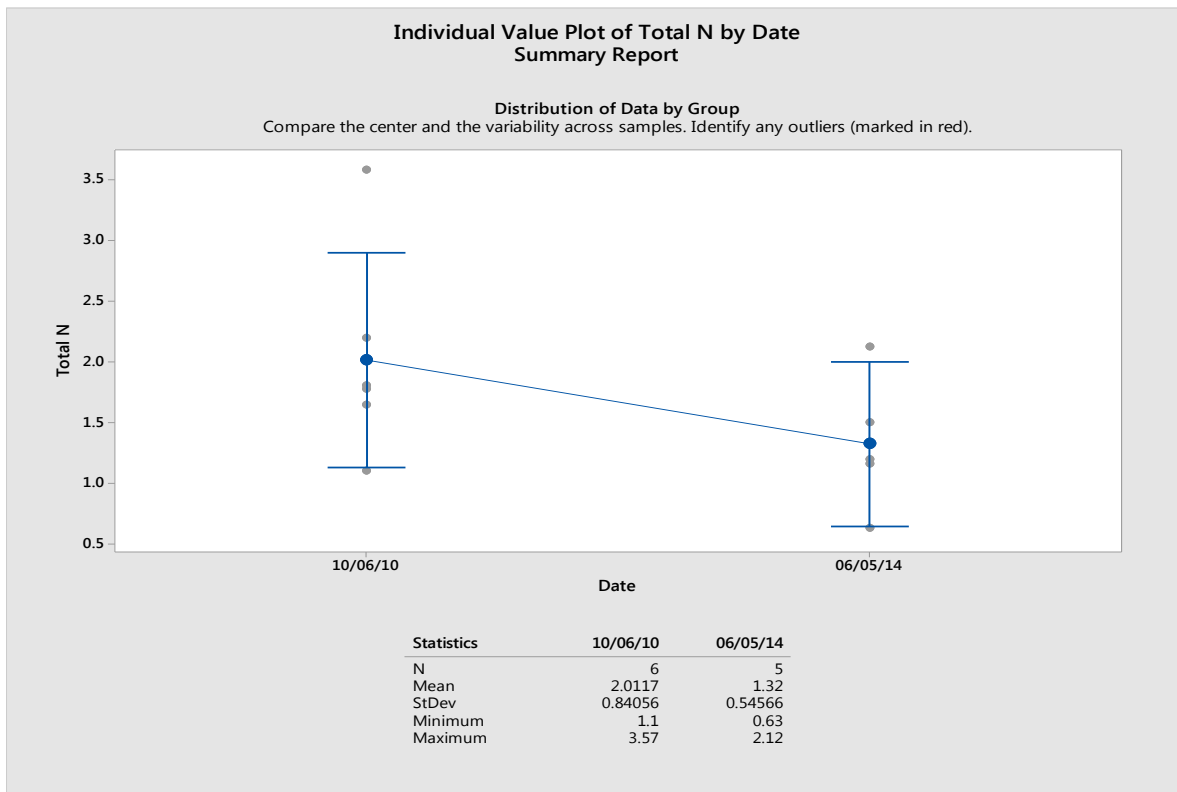


Currently, there is not a water quality based target for TSS in stormwater but TSS is a general indicator of water quality and, lower amounts of TSS are better. For comparison purposes, the average MS4 stormwater result reported for TSS by all towns covered by this permit is 48 mg/L. Areas within your town which have elevated TSS may be places to consider additional stormwater management efforts.

## Total Nitrogen

Nitrogen is an important nutrient in marine and estuarine waters such as Long Island Sound, as well as a concern in fresh water lakes and rivers. High amounts of nitrogen can lead to excessive growth of water plants and algae which then reduces the amount of oxygen available to living things in these waters. Unlawful discharges, animal waste, failing septic systems, leaves, litter and fertilizers are common sources of high nitrogen in stormwater. Responsible use of fertilizers, maintaining septic systems and proper disposal of pet waste will help reduce nitrogen in stormwater.

### Results of annual stormwater monitoring under MS4 general permit for total nitrogen (Total N mg/L) City of New London

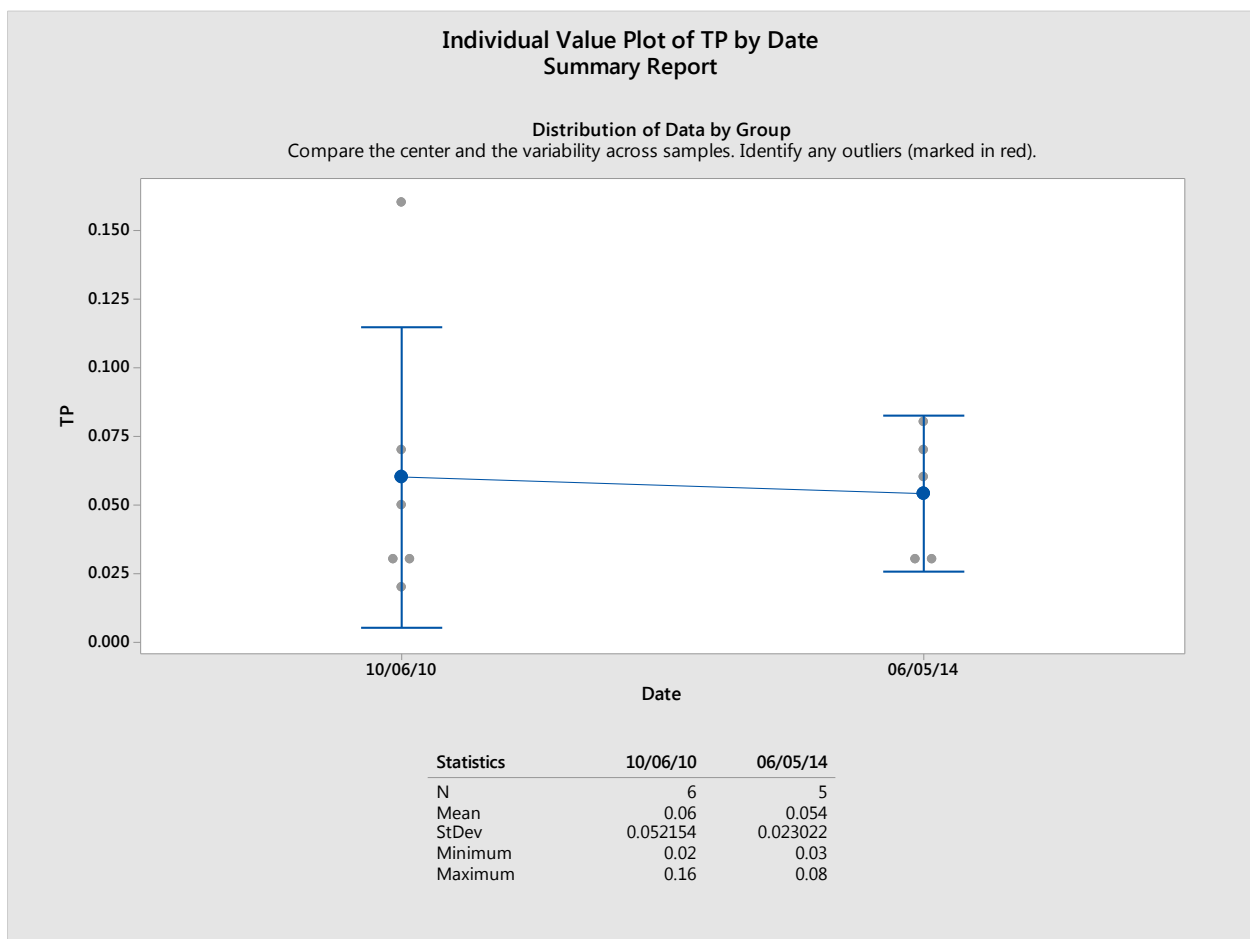


The TMDL for Long Island Sound requires a 10% reduction of nitrogen in stormwater discharges to prevent low oxygen conditions in Long Island Sound. Each town should be working to reduce the amount of nitrogen in their stormwater to address this issue. Under the current draft MS4 permit, any result for total nitrogen greater than 2.5 mg/L will require a follow-up investigation. Areas within your town which have elevated nitrogen may be places to consider additional stormwater management activities.

## Total Phosphorus

Phosphorus is an important nutrient necessary for growth in plants and animals in freshwater. Too much phosphorus in the water can throw off the balance of aquatic ecosystems causing excessive growth of water plants and algae blooms, which reduces the amount of oxygen in the water, potentially harming the fish. Sometimes these algae blooms can contain toxic forms of algae which are harmful to people and animals that come into contact with it. Sources of high phosphorus can be unlawful discharges, fertilizers, litter, leaves, erosion and animal waste.

### Results of annual stormwater monitoring under MS4 permit for total phosphorus (mg/L) City of New London

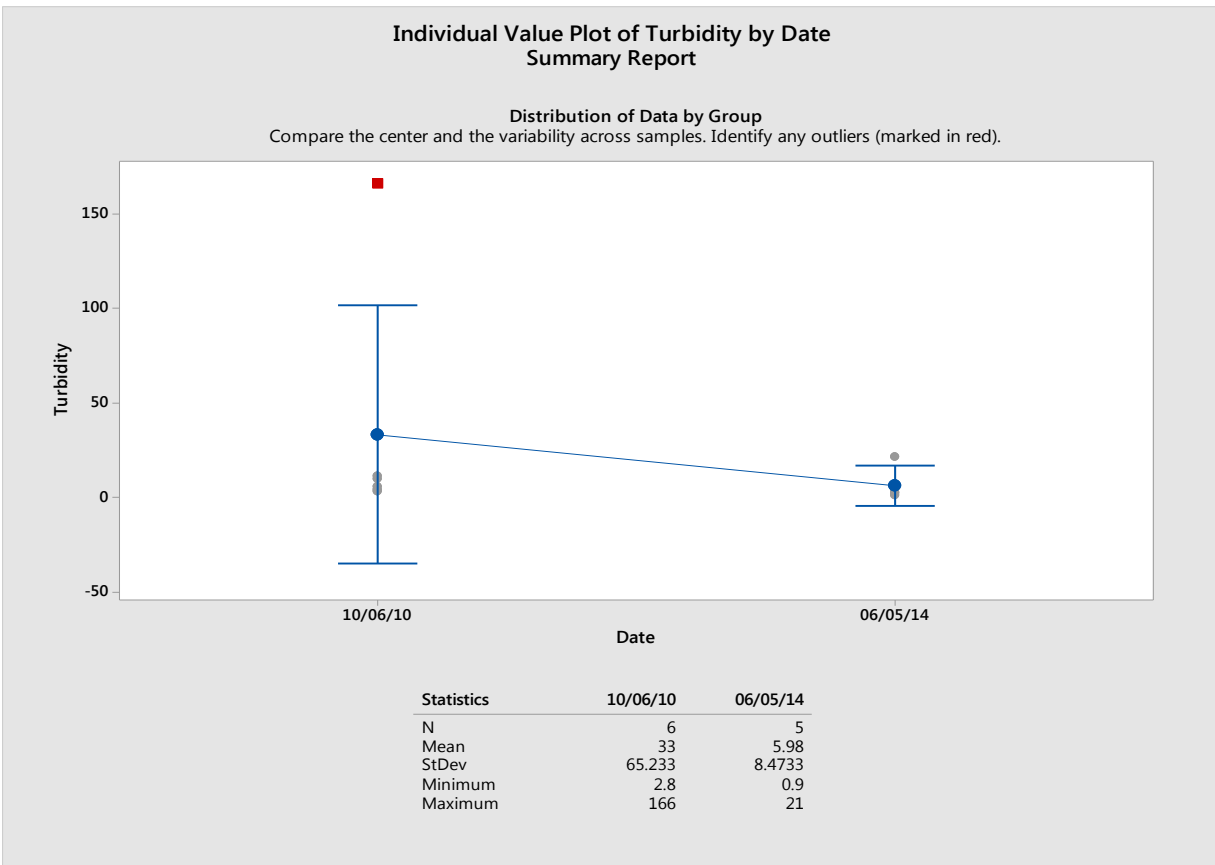


CT DEEP is actively working with many towns to reduce the amount of phosphorus reaching Connecticut's streams and rivers. Under the current draft MS4 permit, a total phosphorus result greater than 0.3 mg/L will require a follow-up investigation. Areas of your town that have elevated levels of phosphorus in the stormwater are good places to develop additional stormwater controls.

## Turbidity

Turbidity measures the clarity of the stormwater sample. It measures how much material (soil, algae, pollution, microbes etc.) is suspended in the sample. High turbidity lowers the water quality of a surface water by blocking sunlight for the plants and makes food harder for the fish to find and may be an indication of a higher amounts of other pollution in the water. Surface waters with high turbidity are visually less appealing for recreational use. High turbidity can be caused by erosion, failing septic systems, decaying plants or animals, and excessive algae growth. Turbidity is reported in Nephelometric Turbidity Units (NTU) which is related to how easily light passes through the water sample.

### Results of annual stormwater monitoring under MS4 permit for turbidity (NTU) City of New London



The Water Quality Standards have a criterion that indicates turbidity should not to exceed 5 NTU above ambient levels. In the draft MS4 permit, a turbidity result greater than 5 NTU over in-stream conditions will require a follow-up investigation. While there is not a fixed statewide criterion for turbidity, lower results are better for the health of the surface waters in town. Areas

with higher levels of turbidity in stormwater would be a good place to develop additional stormwater controls.

### Town Maps

The following maps were created to show the impervious cover (IC) in your town as well as the water quality in the rivers, streams, lakes and estuaries in and around your town.

#### *Impervious Cover on the Town Maps*

IC is shown in red on the maps. Dark red areas indicate a higher percentage of IC, lighter red areas have less IC, while the grey areas indicate very little or no IC.

#### *Water Quality on the Town Maps*

Separate maps are provided for the different uses of the waterbodies such as Aquatic Life Uses, Recreation, and Shellfishing (in coastal towns). The waterbodies are colored to show the health of the waterbody. Green means that the waterbody meets the water quality requirements to fully support the specified use. Yellow means that water quality is poor and that the specified use is not met. Blue means that there is not enough information to know whether or not water quality is good or bad to support the specified use. Additionally, a small map is provided on the left side of each larger map to show which watersheds are within your town.

## Waters Designated For Aquatic Life in the Town of New London

Percent Impervious Cover	Designated For Aquatic Life
0-11%	Fully Supporting
12-25%	Not Supporting
26-50%	Unassessed
51-75%	
76-100%	

### Subregional Basins



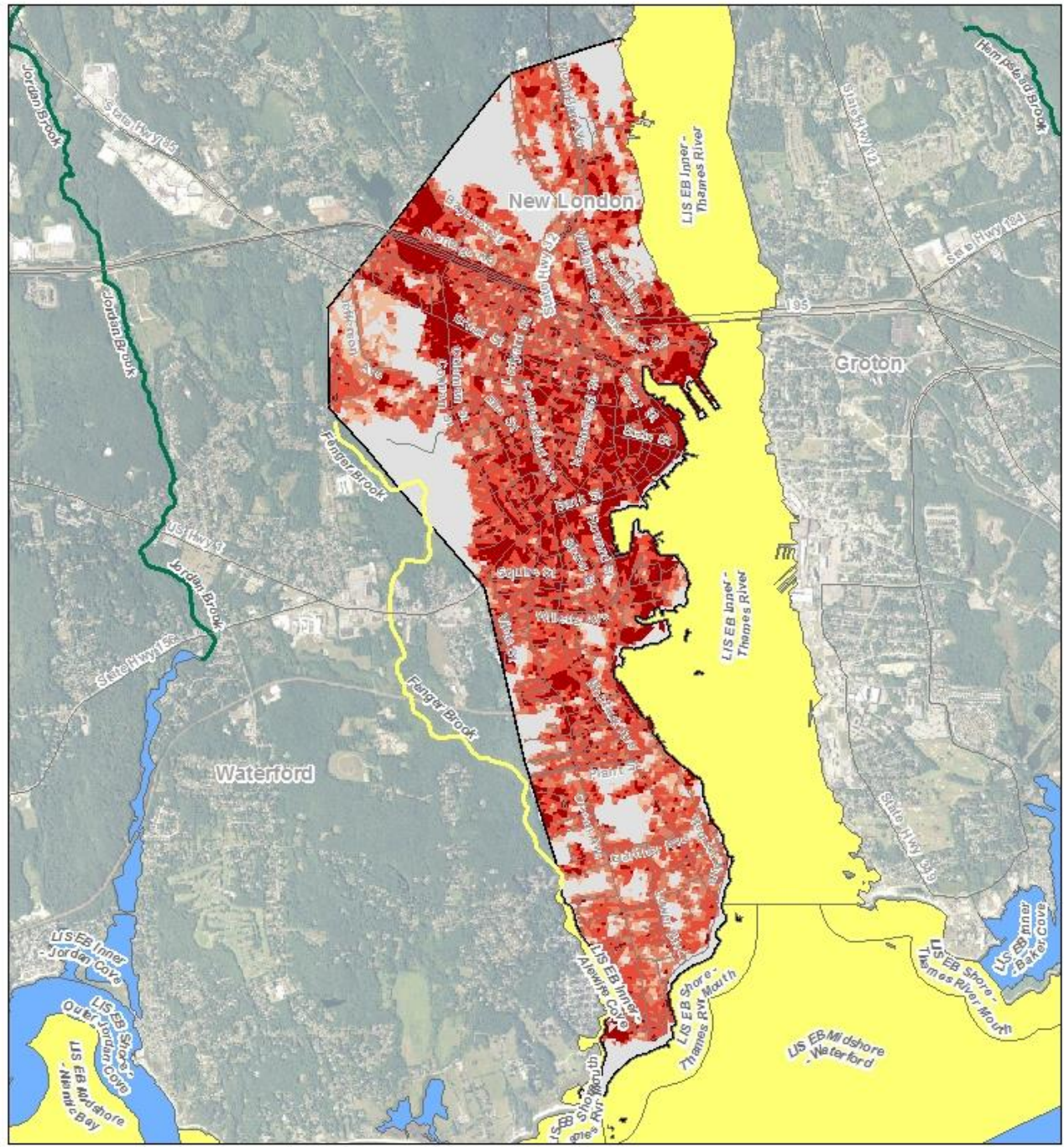
- Jordan Brook
- Thames River
- Southeast Shoreline



0 0.5 1 Miles

These maps were created using the National Land Cover Database (NLCD) 2011 Impervious Cover Percent Data. For more detail please review the metadata document.

Impervious cover (IC) refers to hard surfaces across the landscape such as pavement or buildings. These hard surfaces do not absorb water and prevent rain from soaking in to the ground. As a result, runoff occurs and easily carries pollutants to nearby lakes and streams.





# Waters Designated For Recreation in the Town of New London

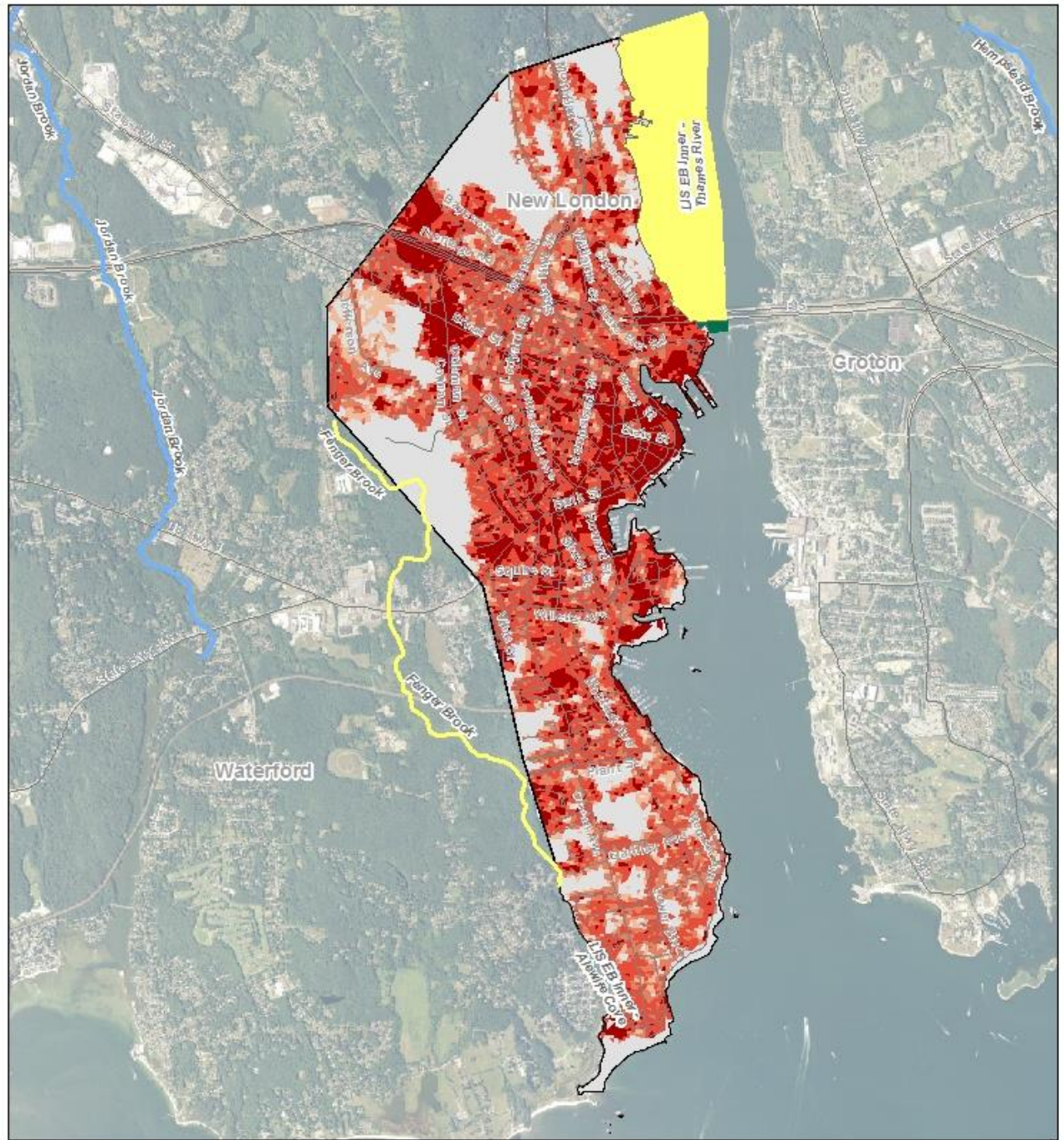


## Subregional Basins



These maps were created using the National Land Cover Database (NLCD) 2011 Impervious Cover Percent Data. For more detail please review the metadata document.

Impervious cover (IC) refers to hard surfaces across the landscape such as pavement or buildings. These hard surfaces do not absorb water and prevent rain from soaking in to the ground. As a result, runoff occurs and easily carries pollutants to nearby lakes and streams.



# Waters Designated For Shellfishing in the Town of New London

Percent Impervious Cover	Designated For Shellfishing
0-11%	Fully Supporting
12-25%	Not Supporting
26-50%	Unassessed
51-75%	
76-100%	

## Subregional Basins



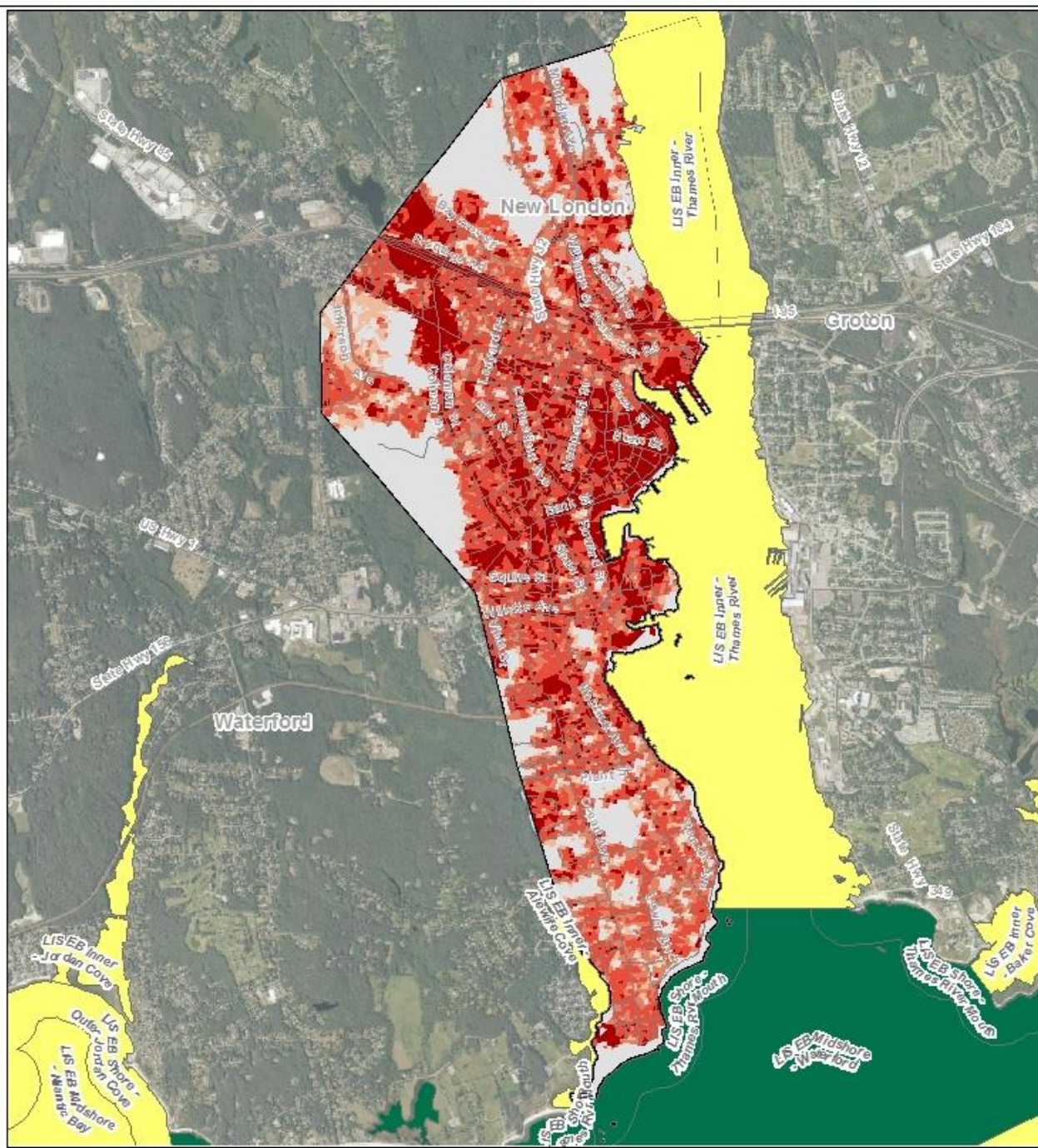
- Jordan Brook
- Southeast Shoreline
- Thames River



0 0.5 1 Miles

These maps were created using the National Land Cover Database (NLCD) 2011 Impervious Cover Percent Data. For more detail please review the metadata document.

Impervious cover (IC) refers to hard surfaces across the landscape such as pavement or buildings. These hard surfaces do not absorb water and prevent rain from soaking into the ground. As a result, runoff occurs and easily carries pollutants to nearby lakes and streams.



## **Factsheet: Town of New Milford Water Quality and Stormwater Summary**

This document was created for each town that has submitted monitoring data under the current Small Municipal Separate Storm Sewer System (MS4) General Permit. What follows is information on how stormwater can affect water quality in streams and rivers and a summary of data submitted by your town. This factsheet is intended to help you interpret your monitoring results and assist you in compliance with the MS4 program.

### Water Quality in Connecticut

Surface waters are important resources that support numerous uses, including water supply, recreation, fishing, shellfishing and sustaining aquatic life. Water quality conditions needed to support these uses are identified within the Connecticut Water Quality Standards (WQS). In order to protect and restore these uses, we need acceptable environmental conditions (physical, chemical and biological) to be present within surface waters.

To assess and track water quality conditions, CT DEEP conducts monitoring across the State. The data is synthesized into a biennial state water quality report called the Integrated Water Quality Report. Currently, specific water quality monitoring in the state encompasses about 50% of rivers, 47% of lakes, and 100% of estuary/coastline. In addition, CT DEEP may have information about certain land uses or discharges which could indicate a potential for water quality to be impacted, even if the waterbody has not been fully monitored and assessed.

To find more detailed information on water quality in your town, please see the Integrated Water Quality Report (IWQR) on the CT DEEP website at [www.ct.gov/deep/iwqr](http://www.ct.gov/deep/iwqr). Information on water quality within your town is also presented on the maps included in this fact sheet.

### Impacts of Impervious Cover on Water Quality

Impervious cover (IC) refers to hard surfaces across the landscape such as roads, sidewalks, parking lots and roofs. Studies have focused on the amount of hard surfaces to evaluate the impacts of stormwater runoff from these hard surfaces on water quality and found that IC affects both the quantity and quality of stormwater. IC forces rain to runoff the land, carrying pollutants quickly and directly to lakes and streams instead of soaking into the ground and being filtered by the soil. For more information on impervious cover, please see the CT DEEP web page [www.ct.gov/deep/imperviouscoverstudies](http://www.ct.gov/deep/imperviouscoverstudies) and EPA's web page [www.epa.gov/caddis/ssr\\_urb\\_isl.html](http://www.epa.gov/caddis/ssr_urb_isl.html).

In general, the higher the percentage of IC in a watershed, the poorer the surface water quality. Research in Connecticut strongly suggests that aquatic life will be harmed when the IC within a

watershed exceeds 12%. Stormwater pollution from IC is a likely cause of impairment for these waterbodies.

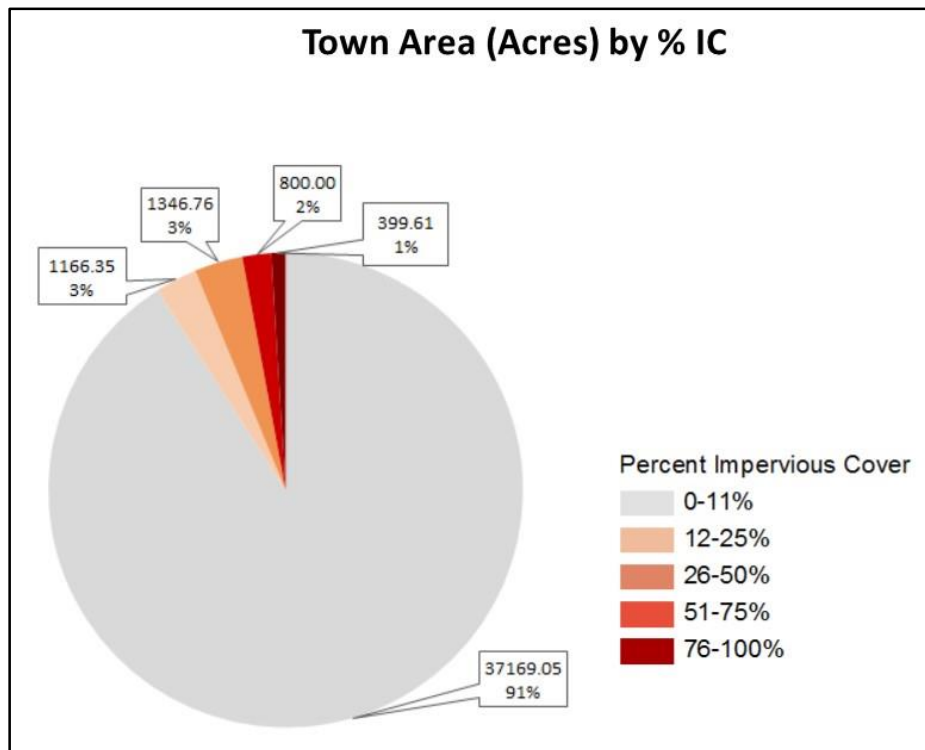
### Town of New Milford: Impervious Cover Data

This chart shows the amount of area within your town that contains IC. Data is grouped by acres and percent IC. While all levels of IC can contribute stormwater to streams, it is important to note that land with IC greater than 12% in town is likely to be contributing enough stormwater to streams to have a negative impact on water quality.

Towns should aim to make stormwater improvements in areas with IC greater than 12% in an effort to reduce the amount of stormwater pollution reaching surface waters which will protect and improve water quality.

For more information on areas of impervious cover within your town, please see the maps at the back of this factsheet.

Amounts of Impervious Cover within the Town of New Milford



### Pollution Reduction

Waterbodies often can handle a certain amount of pollutants and still maintain good water quality. However, impaired waterbodies have too much pollution impacting their water quality and therefore the streams do not support all uses for the waterbody. Total Maximum Daily Loads

(TMDLs) are pollution reduction budgets developed for impaired waterbodies in order to meet water quality. If the pollution budget is achieved through the recommended pollution reduction measures, then the waterbody is expected to meet water quality. CT DEEP also supports impaired waters restoration through watershed based plans ([www.ct.gov/deep/watershed](http://www.ct.gov/deep/watershed)) which provide more specific non-point source pollution control measures. The following TMDLs or pollution reduction strategies have been developed and apply to areas within your town.

TMDLs or Strategies Applicable to the Town of New Milford

<b>Name of TMDL or Strategy</b>	<b>Pollutant</b>	<b>Waterbody Name</b>	<b>Link</b>
Statewide Bacteria TMDL	Bacteria	Housatonic River / Lake Zoar / Lake Housatonic / Curtiss Brook	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/housatonicriver6000.pdf">www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/housatonicriver6000.pdf</a>
Statewide Bacteria TMDL	Bacteria	Shepaug River / Walker Brook	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/shepaugriver6700.pdf">www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/shepaugriver6700.pdf</a>
A TMDL Analysis for Kenosia Lake in Danbury, CT	Nitrogen & Phosphorus	Kenosia Lake	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/kenosialaketmdl.pdf">http://www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/kenosialaketmdl.pdf</a>
A TMDL Analysis for Recreational Uses of the Still River Regional Basin	Bacteria	Still River / Miry Brook / Kohanza Brook / Padanaram / Sympaug Brook / East Swamp Brook / Limekiln Brook	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/s_till_final.pdf">www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/s_till_final.pdf</a>
A TMDL Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound	Nitrogen	Long Island Sound and contributing watersheds	<a href="http://www.ct.gov/deep/lib/deep/water/lis_water_quality/nitrogen_control_program/tmdl.pdf">www.ct.gov/deep/lib/deep/water/lis_water_quality/nitrogen_control_program/tmdl.pdf</a>
Northeast Regional Mercury TMDL	Mercury	All CT Inland waters	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/ne_hg_tmdl.pdf">www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/ne_hg_tmdl.pdf</a>
Interim Phosphorus Reduction Strategy	Phosphorus	Certain CT Inland waters	<a href="http://www.ct.gov/deep/lib/deep/water/water_quality_standards/p/interimmngntphosstrat_042614.pdf">www.ct.gov/deep/lib/deep/water/water_quality_standards/p/interimmngntphosstrat_042614.pdf</a>

For more information on these TMDLs or strategies please go to our website [www.ct.gov/deep/tmdl](http://www.ct.gov/deep/tmdl).

## Stormwater Quality Monitoring

Regular monitoring for targeted pollutants in stormwater provides an indication of potential for water quality impacts and helps identify sources and unlawful discharges. Annual monitoring at 6 locations from different areas of town has been a requirement of the MS4 permit since 2004. CT DEEP uses that information to evaluate the quality of stormwater and the potential for impacts to surface waters as well as to make sure that stormwater is managed properly.

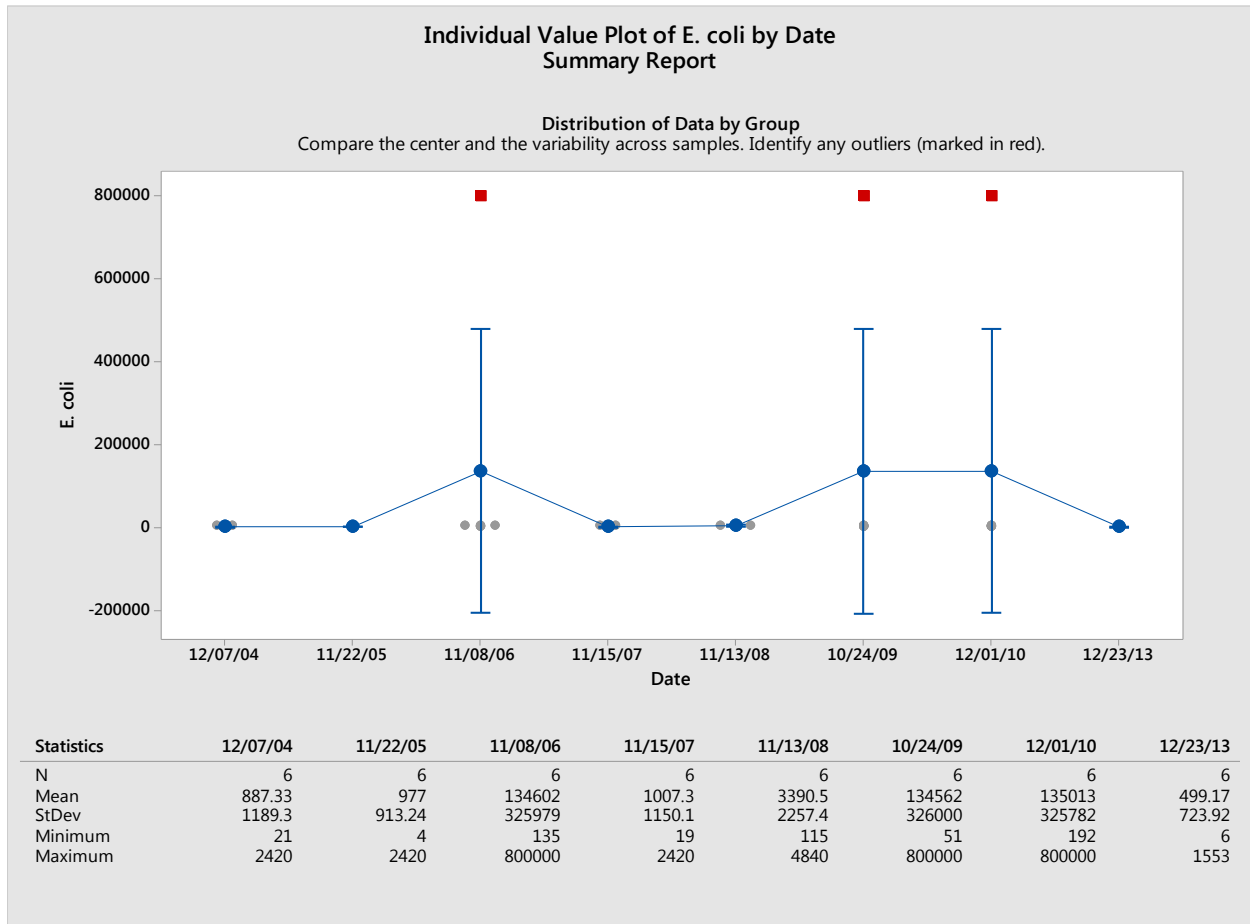
Below are 5 graphs tracking stormwater results submitted by your town for 5 parameters reported under the current MS4 General Permit. The results of each stormwater test submitted to CT DEEP by your town is shown. Individual sample results are shown in grey while the average of the samples collected on a particular day is shown in blue, with a line connecting the averages for the various sample dates. The bars show the statistical range of samples for each day with the red squares showing results which are considered to be outliers, that is, very different from the other samples collected on that day. The chart on the graph lists the sample dates and some basic statistics:

<b>Statistic</b>	<b>Description</b>
N	Number of stormwater samples collected on that date
Mean	Average of the results reported for that sample date
Standard Deviation (StdDev)	A measure of the variability of the results for the sample date
Minimum	The lowest sample result for the sample date
Maximum	The highest sample result for the sample date

## Bacteria

*Escherichia coli* (*E. coli*) is a bacteria that lives in the intestines of humans and other warm-blooded animals and is used to indicate the presence of fecal matter in surface waters. Some strains of *E. coli* and other pathogens found in fecal material cause serious illness in people coming in contact with it. For this reason, high amounts of bacteria will cause authorities to close beaches for swimming. Bacteria is measured as the number of colony forming units, or CFU, per 100 ml of water. Any result that was reported as “to numerous to count” is included on the chart as 800,000 CFU/100 mL.

Results of annual stormwater monitoring under MS4 permit for *E.coli* (CFU/ 100 mL of sample)  
Town of New Milford



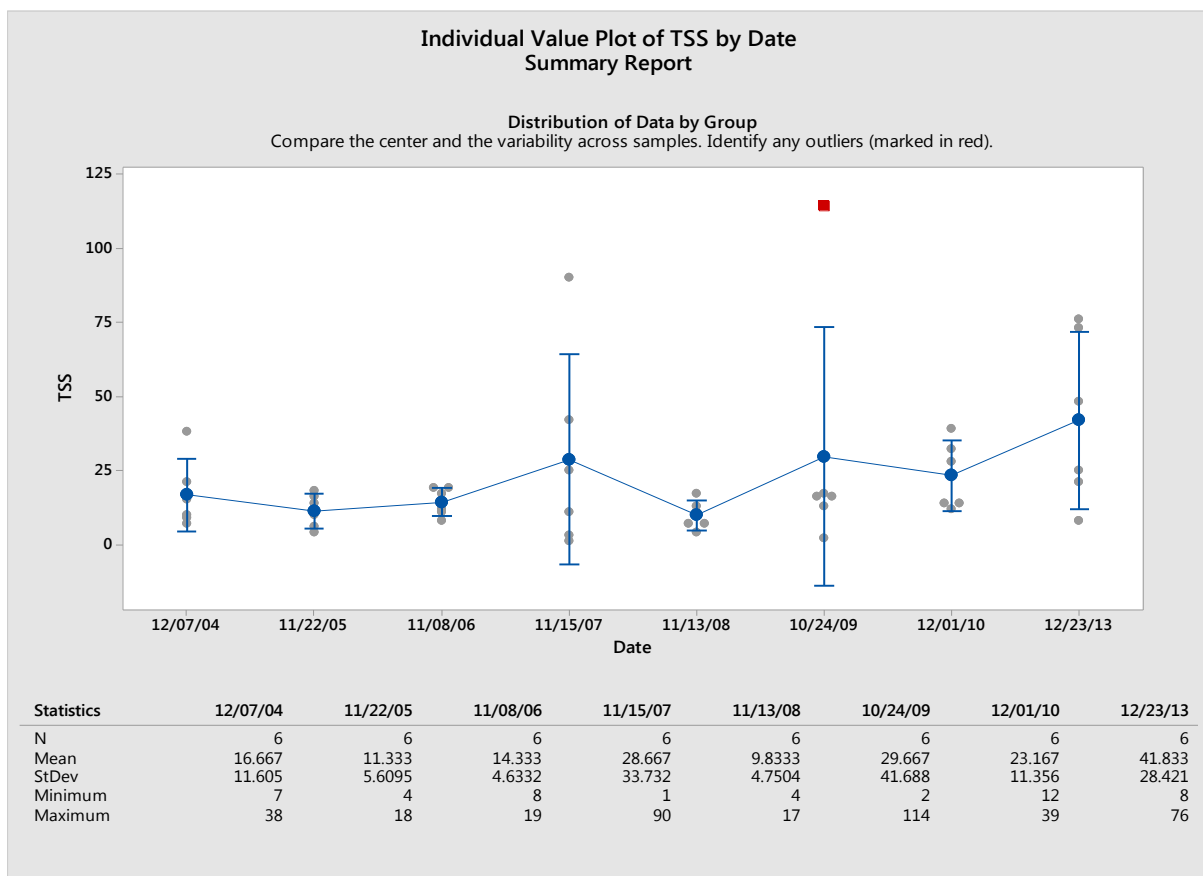
To support recreational uses of surface waters, the CT DEEP Water Quality Standards indicate that the average amount of *E. coli* found in a freshwater water body should be less than 126 CFU/100 mL and that a single sample tested for *E. coli* should be less than 235 CFU/100 mL at a designated swimming area and less than 410 CFU/100 mL in other areas. Monitoring for *E. coli* is currently required in the MS4 permit. Enterococci is another bacteria used to indicate the presence of fecal material in salt water environments. For recreation in salt water the Water Quality Standards indicate that average amount of Enterococci should be less than 35 CFU/100 mL in a designated swimming area and that a single sample tested for Enterococci should be less than 104 CFU/100 mL and in all other areas less than 500 CFU/100 mL. These targets have been included in the statewide bacteria TMDLs. In the Draft MS4 permit, *E.coli* results higher than 235 CFU/100 mL at a designated swimming area or greater than 410 CFU/100 mL in other areas requires a follow-up investigation. Individual stormwater sample results that exceed the applicable single sample maximum value for bacteria could impact water quality, so the associated outfalls should be evaluated for additional stormwater management.

## Total Suspended Solids

Total Suspended Solids (TSS) is a measurement of the amount of solids (including sand and silt) found in the stormwater sample. High concentrations of TSS can lower water quality in the receiving stream by transporting various pollutants to the waterbody where they can directly affect aquatic life or affect aquatic life by absorbing light, reducing photosynthesis, and by making the water warmer. TSS can also clog fish gills and smother fish eggs and suffocate the organisms that fish eat. TSS comes from erosion and is found in agricultural, urban and industrial runoff. TSS can be reduced by protecting land from erosion and allowing stormwater time to settle before discharging to surface waters.

### Results of annual stormwater monitoring under the MS4 general permit for TSS (mg/L)

#### Town of New Milford



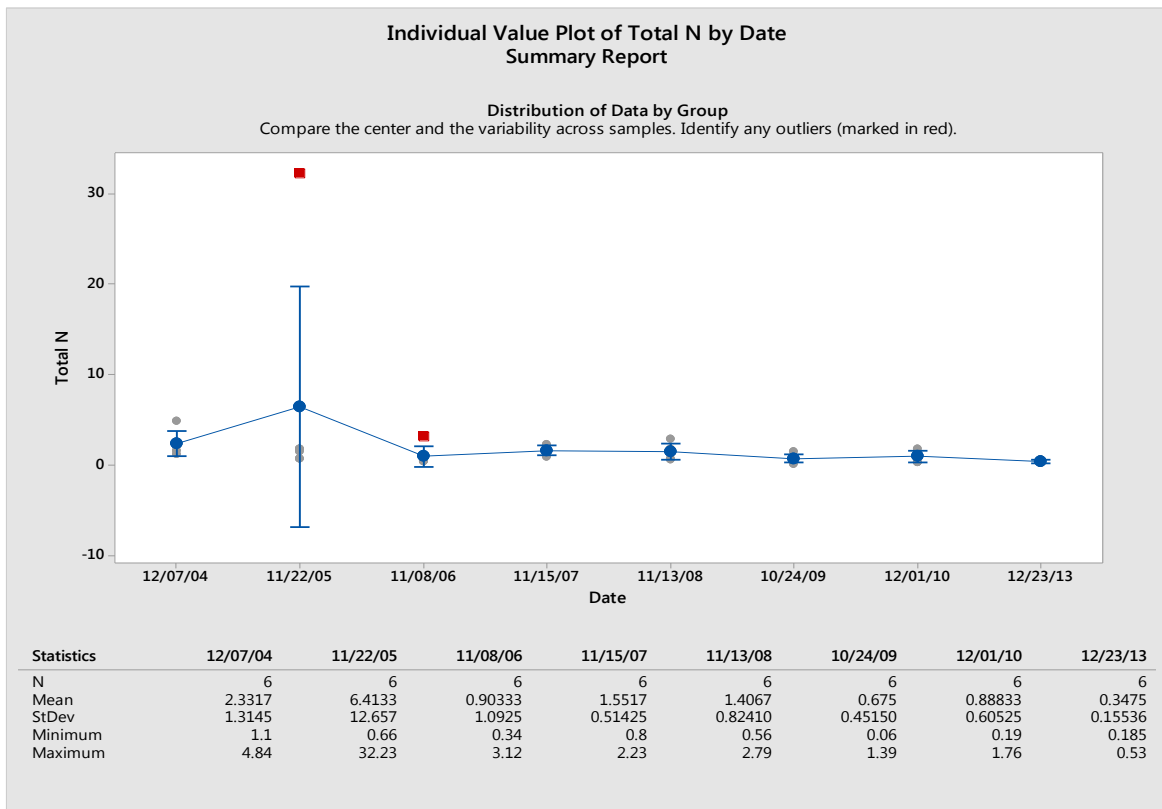
Currently, there is not a water quality based target for TSS in stormwater but TSS is a general indicator of water quality and, lower amounts of TSS are better. For comparison purposes, the average MS4 stormwater result reported for TSS by all towns covered by this permit is 48 mg/L. Areas within your town which have elevated TSS may be places to consider additional stormwater management efforts.



## Total Nitrogen

Nitrogen is an important nutrient in marine and estuarine waters such as Long Island Sound, as well as a concern in fresh water lakes and rivers. High amounts of nitrogen can lead to excessive growth of water plants and algae which then reduces the amount of oxygen available to living things in these waters. Unlawful discharges, animal waste, failing septic systems, leaves, litter and fertilizers are common sources of high nitrogen in stormwater. Responsible use of fertilizers, maintaining septic systems and proper disposal of pet waste will help reduce nitrogen in stormwater.

### Results of annual stormwater monitoring under MS4 general permit for total nitrogen (Total N mg/L) Town of New Milford

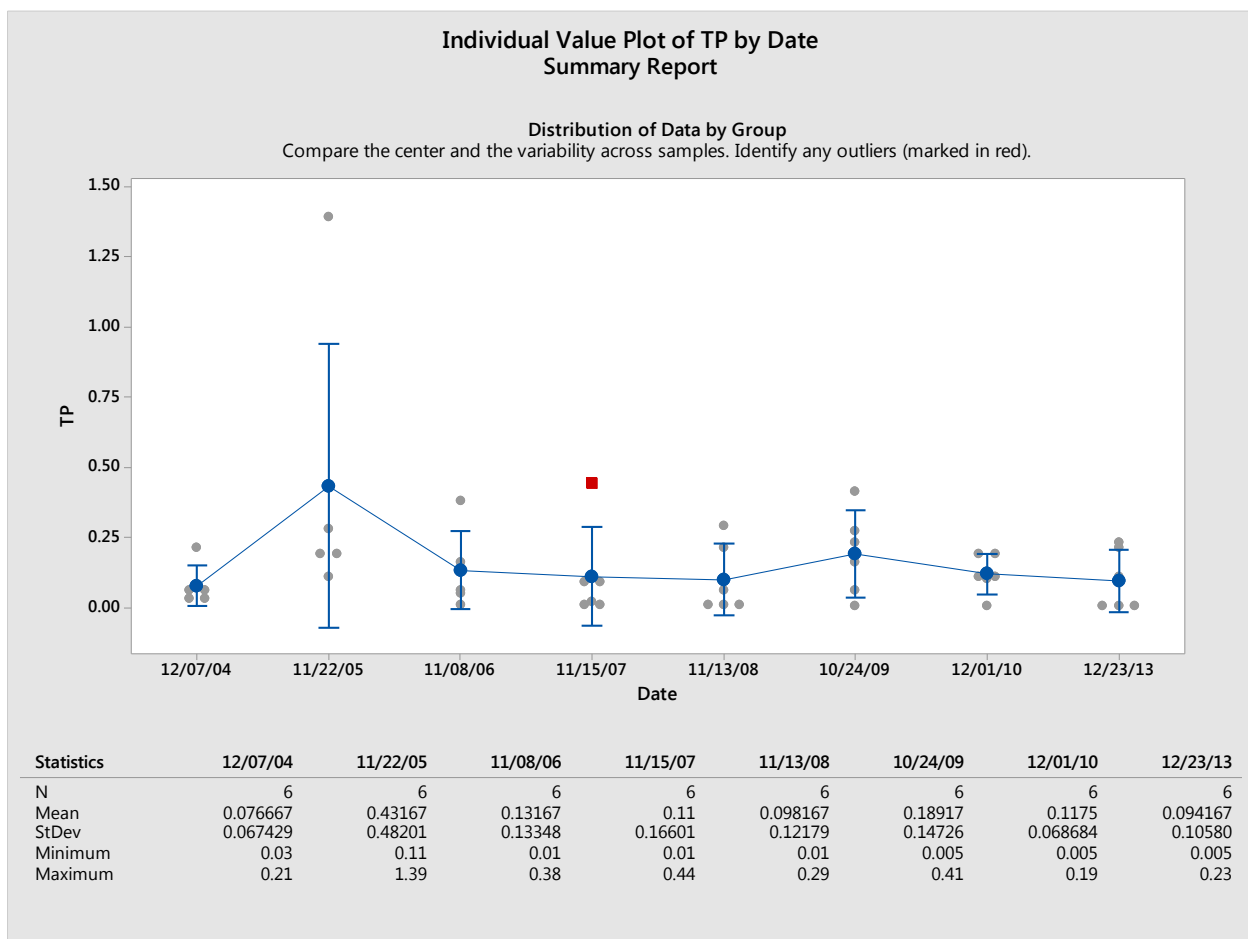


The TMDL for Long Island Sound requires a 10% reduction of nitrogen in stormwater discharges to prevent low oxygen conditions in Long Island Sound. Each town should be working to reduce the amount of nitrogen in their stormwater to address this issue. Under the current draft MS4 permit, any result for total nitrogen greater than 2.5 mg/L will require a follow-up investigation. Areas within your town which have elevated nitrogen may be places to consider additional stormwater management activities.

## Total Phosphorus

Phosphorus is an important nutrient necessary for growth in plants and animals in freshwater. Too much phosphorus in the water can throw off the balance of aquatic ecosystems causing excessive growth of water plants and algae blooms, which reduces the amount of oxygen in the water, potentially harming the fish. Sometimes these algae blooms can contain toxic forms of algae which are harmful to people and animals that come into contact with it. Sources of high phosphorus can be unlawful discharges, fertilizers, litter, leaves, erosion and animal waste.

### Results of annual stormwater monitoring under MS4 permit for total phosphorus (mg/L) Town of New Milford

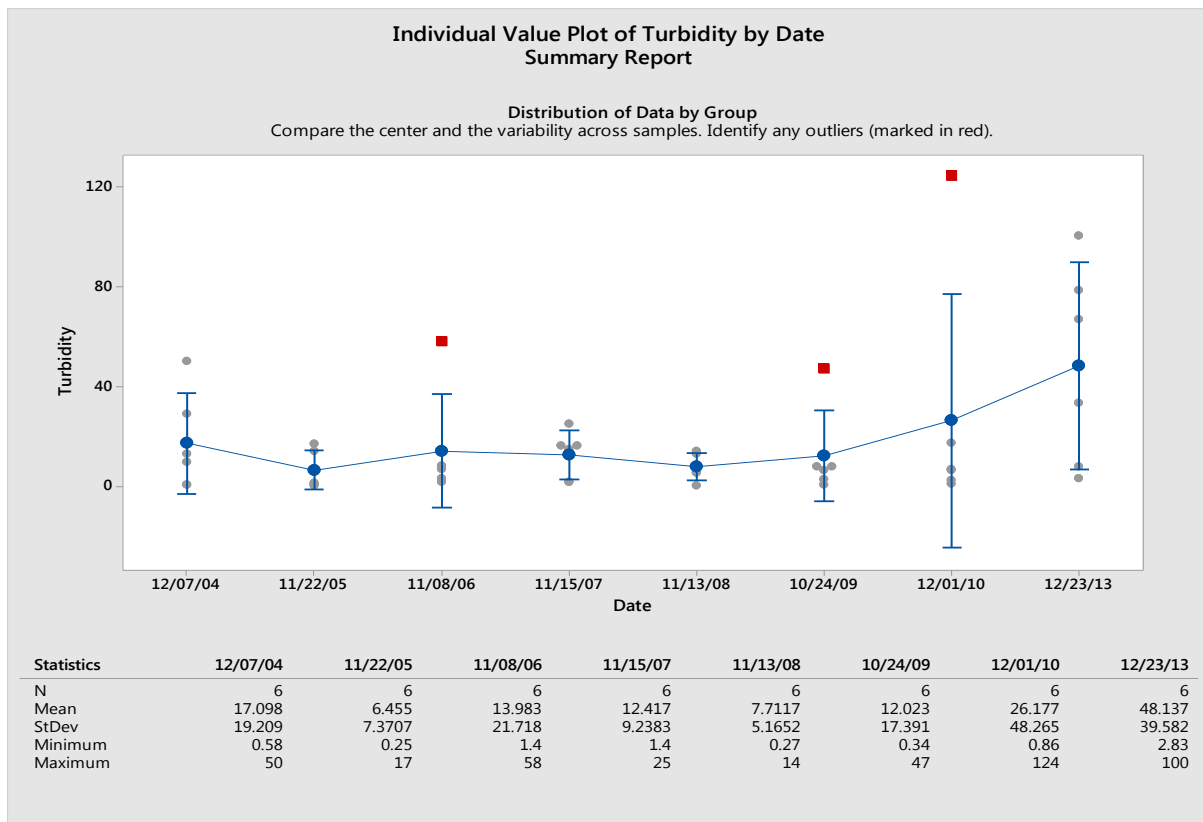


CT DEEP is actively working with many towns to reduce the amount of phosphorus reaching Connecticut's streams and rivers. Under the current draft MS4 permit, a total phosphorus result greater than 0.3 mg/L will require a follow-up investigation. Areas of your town that have elevated levels of phosphorus in the stormwater are good places to develop additional stormwater controls.

## Turbidity

Turbidity measures the clarity of the stormwater sample. It measures how much material (soil, algae, pollution, microbes etc.) is suspended in the sample. High turbidity lowers the water quality of a surface water by blocking sunlight for the plants and makes food harder for the fish to find and may be an indication of a higher amounts of other pollution in the water. Surface waters with high turbidity are visually less appealing for recreational use. High turbidity can be caused by erosion, failing septic systems, decaying plants or animals, and excessive algae growth. Turbidity is reported in Nephelometric Turbidity Units (NTU) which is related to how easily light passes through the water sample.

### Results of annual stormwater monitoring under MS4 permit for turbidity (NTU) Town of New Milford



The Water Quality Standards have a criterion that indicates turbidity should not to exceed 5 NTU above ambient levels. In the draft MS4 permit, a turbidity result greater than 5 NTU over in-stream conditions will require a follow-up investigation. While there is not a fixed statewide criterion for turbidity, lower results are better for the health of the surface waters in town. Areas with higher levels of turbidity in stormwater would be a good place to develop additional stormwater controls.

## Town Maps

The following maps were created to show the impervious cover (IC) in your town as well as the water quality in the rivers, streams, lakes and estuaries in and around your town.

### *Impervious Cover on the Town Maps*

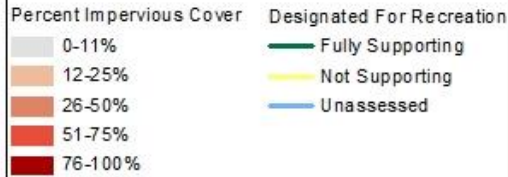
IC is shown in red on the maps. Dark red areas indicate a higher percentage of IC, lighter red areas have less IC, while the grey areas indicate very little or no IC.

### *Water Quality on the Town Maps*

Separate maps are provided for the different uses of the waterbodies such as Aquatic Life Uses, Recreation, and Shellfishing (in coastal towns). The waterbodies are colored to show the health of the waterbody. Green means that the waterbody meets the water quality requirements to fully support the specified use. Yellow means that water quality is poor and that the specified use is not met. Blue means that there is not enough information to know whether or not water quality is good or bad to support the specified use. Additionally, a small map is provided on the left side of each larger map to show which watersheds are within your town.



# Waters Designated For Recreation in the Town of New Milford

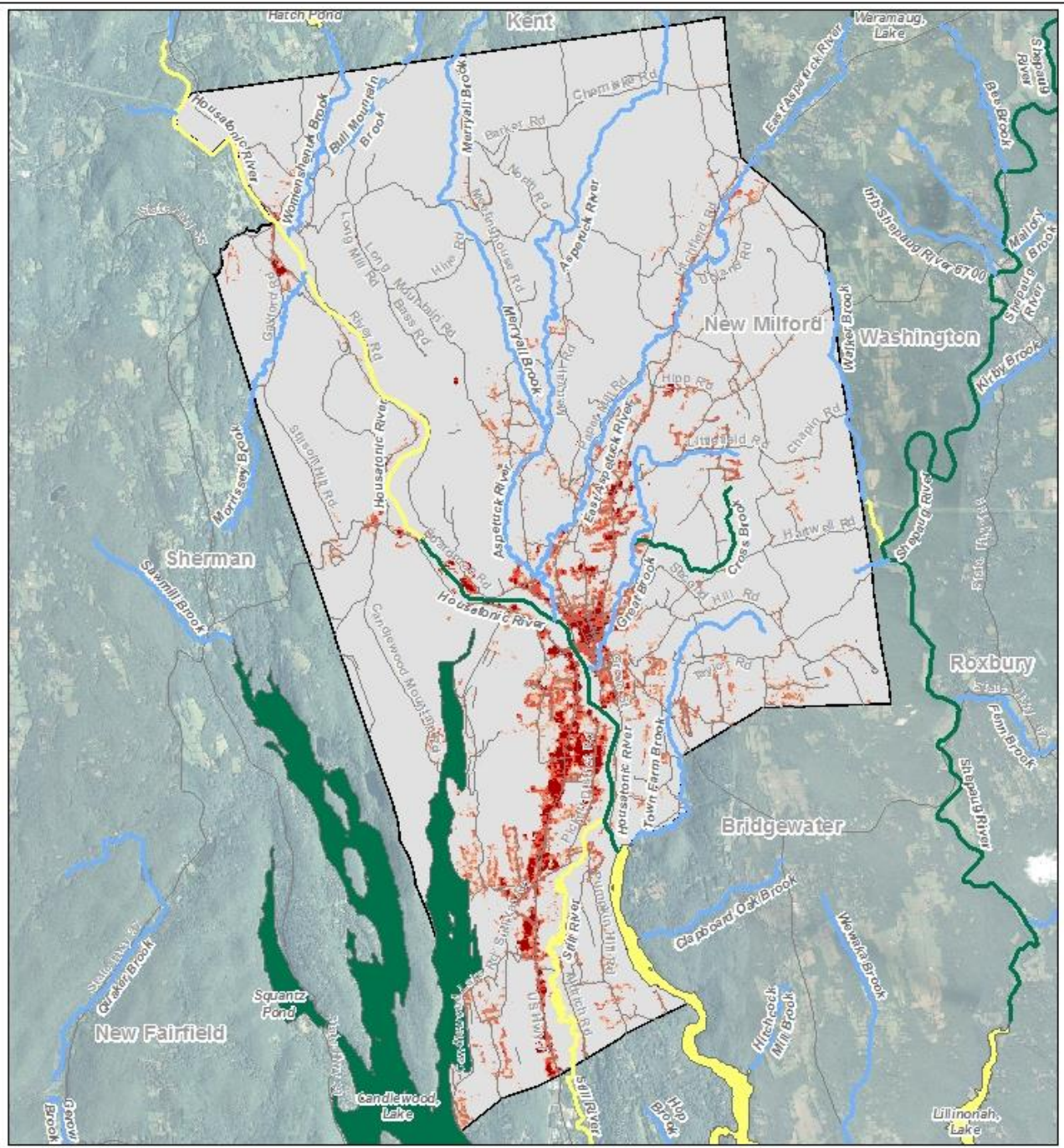


## Subregional Basins



These maps were created using the National Land Cover Database (NLCD) 2011 Impervious Cover Percent Data. For more detail please review the metadata document.

Impervious cover (IC) refers to hard surfaces across the landscape such as pavement or buildings. These hard surfaces do not absorb water and prevent rain from soaking in to the ground. As a result, runoff occurs and easily carries pollutants to nearby lakes and streams.



## **Factsheet: Town of Newington Water Quality and Stormwater Summary**

This document was created for each town that has submitted monitoring data under the current Small Municipal Separate Storm Sewer System (MS4) General Permit. What follows is information on how stormwater can affect water quality in streams and rivers and a summary of data submitted by your town. This factsheet is intended to help you interpret your monitoring results and assist you in compliance with the MS4 program.

### Water Quality in Connecticut

Surface waters are important resources that support numerous uses, including water supply, recreation, fishing, shellfishing and sustaining aquatic life. Water quality conditions needed to support these uses are identified within the Connecticut Water Quality Standards (WQS). In order to protect and restore these uses, we need acceptable environmental conditions (physical, chemical and biological) to be present within surface waters.

To assess and track water quality conditions, CT DEEP conducts monitoring across the State. The data is synthesized into a biennial state water quality report called the Integrated Water Quality Report. Currently, specific water quality monitoring in the state encompasses about 50% of rivers, 47% of lakes, and 100% of estuary/coastline. In addition, CT DEEP may have information about certain land uses or discharges which could indicate a potential for water quality to be impacted, even if the waterbody has not been fully monitored and assessed.

To find more detailed information on water quality in your town, please see the Integrated Water Quality Report (IWQR) on the CT DEEP website at [www.ct.gov/deep/iwqr](http://www.ct.gov/deep/iwqr). Information on water quality within your town is also presented on the maps included in this fact sheet.

### Impacts of Impervious Cover on Water Quality

Impervious cover (IC) refers to hard surfaces across the landscape such as roads, sidewalks, parking lots and roofs. Studies have focused on the amount of hard surfaces to evaluate the impacts of stormwater runoff from these hard surfaces on water quality and found that IC affects both the quantity and quality of stormwater. IC forces rain to runoff the land, carrying pollutants quickly and directly to lakes and streams instead of soaking into the ground and being filtered by the soil. For more information on impervious cover, please see the CT DEEP web page [www.ct.gov/deep/imperviouscoverstudies](http://www.ct.gov/deep/imperviouscoverstudies) and EPA's web page [www.epa.gov/caddis/ssr\\_urb\\_isl.html](http://www.epa.gov/caddis/ssr_urb_isl.html).

In general, the higher the percentage of IC in a watershed, the poorer the surface water quality. Research in Connecticut strongly suggests that aquatic life will be harmed when the IC within a

watershed exceeds 12%. Stormwater pollution from IC is a likely cause of impairment for these waterbodies.

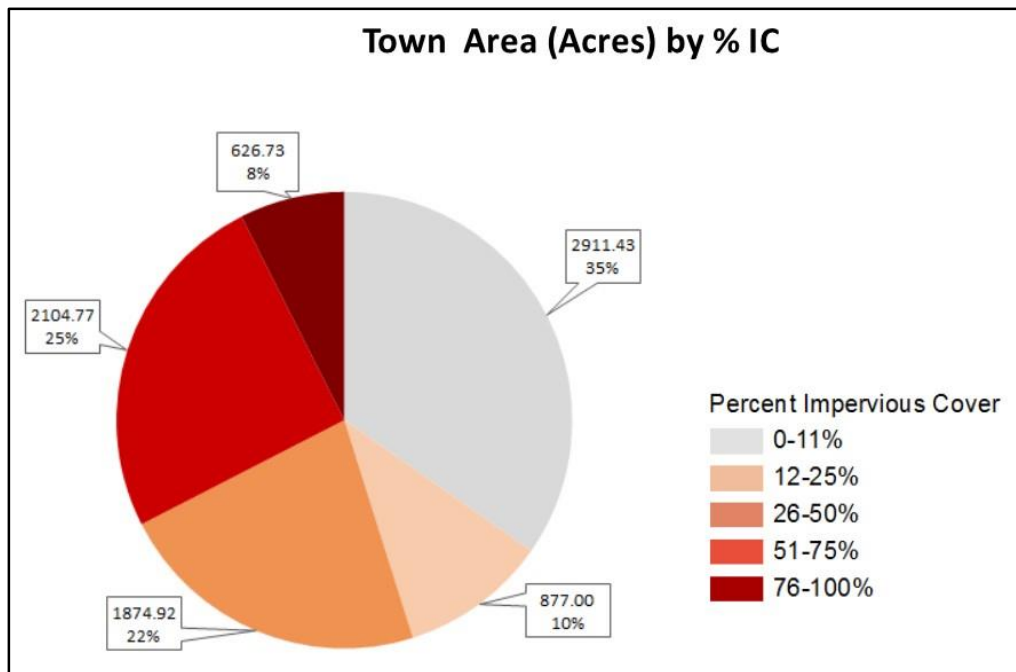
### Town of Newington: Impervious Cover Data

This chart shows the amount of area within your town that contains IC. Data is grouped by acres and percent IC. While all levels of IC can contribute stormwater to streams, it is important to note that land with IC greater than 12% in town is likely to be contributing enough stormwater to streams to have a negative impact on water quality.

Towns should aim to make stormwater improvements in areas with IC greater than 12% in an effort to reduce the amount of stormwater pollution reaching surface waters which will protect and improve water quality.

For more information on areas of impervious cover within your town, please see the maps at the back of this factsheet.

Amounts of Impervious Cover within the Town of Newington



### Pollution Reduction

Waterbodies often can handle a certain amount of pollutants and still maintain good water quality. However, impaired waterbodies have too much pollution impacting their water quality and therefore the streams do not support all uses for the waterbody. Total Maximum Daily Loads (TMDLs) are pollution reduction budgets developed for impaired waterbodies in order to meet water quality. If the pollution budget is achieved through the recommended pollution reduction



measures, then the waterbody is expected to meet water quality. CT DEEP also supports impaired waters restoration through watershed based plans ([www.ct.gov/deep/watershed](http://www.ct.gov/deep/watershed)) which provide more specific non-point source pollution control measures. The following TMDLs or pollution reduction strategies have been developed and apply to areas within your town.

TMDLs or Strategies Applicable to the Town of Newington

<b>Name of TMDL or Strategy</b>	<b>Pollutant</b>	<b>Waterbody Name</b>	<b>Link</b>
Statewide Bacteria TMDL	Bacteria	Piper Brook	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/piperbrook4402.pdf">www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/piperbrook4402.pdf</a>
Statewide Bacteria TMDL	Bacteria	Park River / South Branch Park River	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/parkriver4400.pdf">www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/parkriver4400.pdf</a>
Statewide Bacteria TMDL	Bacteria	Trout Brook	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/troutbrook4403.pdf">www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/troutbrook4403.pdf</a>
A TMDL Analysis for the Mattabesset River Regional Basin	Bacteria	Mattabesset River / John Hall Brook / Little Brook / Spruce Brook / Coles Brook / Miner Brook / Willow Brook 4600 / Belcher Brook / Webster Brook / Sawmill Brook / Coginchaug River / Willow Brook 4602	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/mattbasintmdlfinal.pdf">www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/mattbasintmdlfinal.pdf</a>
A TMDL Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound	Nitrogen	Long Island Sound and contributing watersheds	<a href="http://www.ct.gov/deep/lib/deep/water/lis_water_quality/nitrogen_control_program/tmdl.pdf">www.ct.gov/deep/lib/deep/water/lis_water_quality/nitrogen_control_program/tmdl.pdf</a>
Northeast Regional Mercury TMDL	Mercury	All CT Inland waters	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/ne_hg_tmdl.pdf">www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/ne_hg_tmdl.pdf</a>

For more information on these TMDLs or strategies please go to our website [www.ct.gov/deep/tmdl](http://www.ct.gov/deep/tmdl).

## Stormwater Quality Monitoring

Regular monitoring for targeted pollutants in stormwater provides an indication of potential for water quality impacts and helps identify sources and unlawful discharges. Annual monitoring at 6 locations from different areas of town has been a requirement of the MS4 permit since 2004. CT DEEP uses that information to evaluate the quality of stormwater and the potential for impacts to surface waters as well as to make sure that stormwater is managed properly.

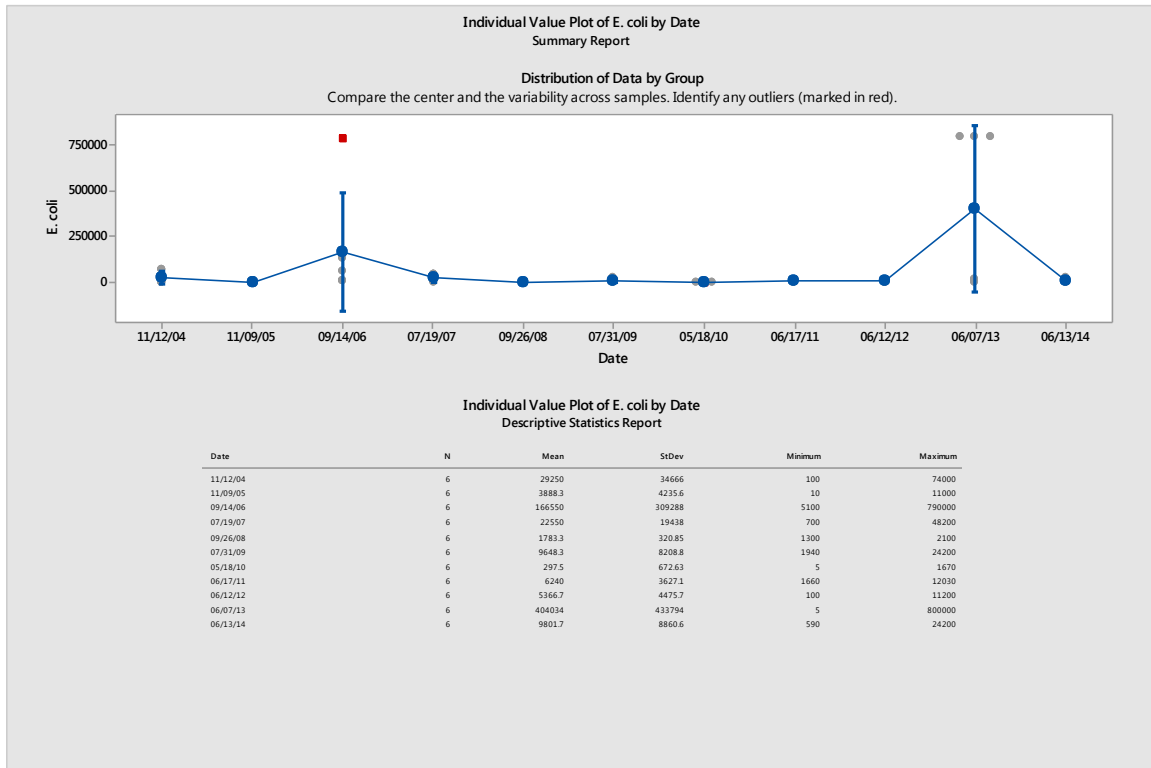
Below are 5 graphs tracking stormwater results submitted by your town for 5 parameters reported under the current MS4 General Permit. The results of each stormwater test submitted to CT DEEP by your town is shown. Individual sample results are shown in grey while the average of the samples collected on a particular day is shown in blue, with a line connecting the averages for the various sample dates. The bars show the statistical range of samples for each day with the red squares showing results which are considered to be outliers, that is, very different from the other samples collected on that day. The chart on the graph lists the sample dates and some basic statistics:

<b>Statistic</b>	<b>Description</b>
N	Number of stormwater samples collected on that date
Mean	Average of the results reported for that sample date
Standard Deviation (StdDev)	A measure of the variability of the results for the sample date
Minimum	The lowest sample result for the sample date
Maximum	The highest sample result for the sample date

## Bacteria

*Escherichia coli* (*E. coli*) is a bacteria that lives in the intestines of humans and other warm-blooded animals and is used to indicate the presence of fecal matter in surface waters. Some strains of *E. coli* and other pathogens found in fecal material cause serious illness in people coming in contact with it. For this reason, high amounts of bacteria will cause authorities to close beaches for swimming. Bacteria is measured as the number of colony forming units, or CFU, per 100 ml of water. Any result that was reported as “to numerous to count” is included on the chart as 800,000 CFU/100 mL.

Results of annual stormwater monitoring under MS4 permit for *E.coli* (CFU/ 100 mL of sample)  
Town of Newington

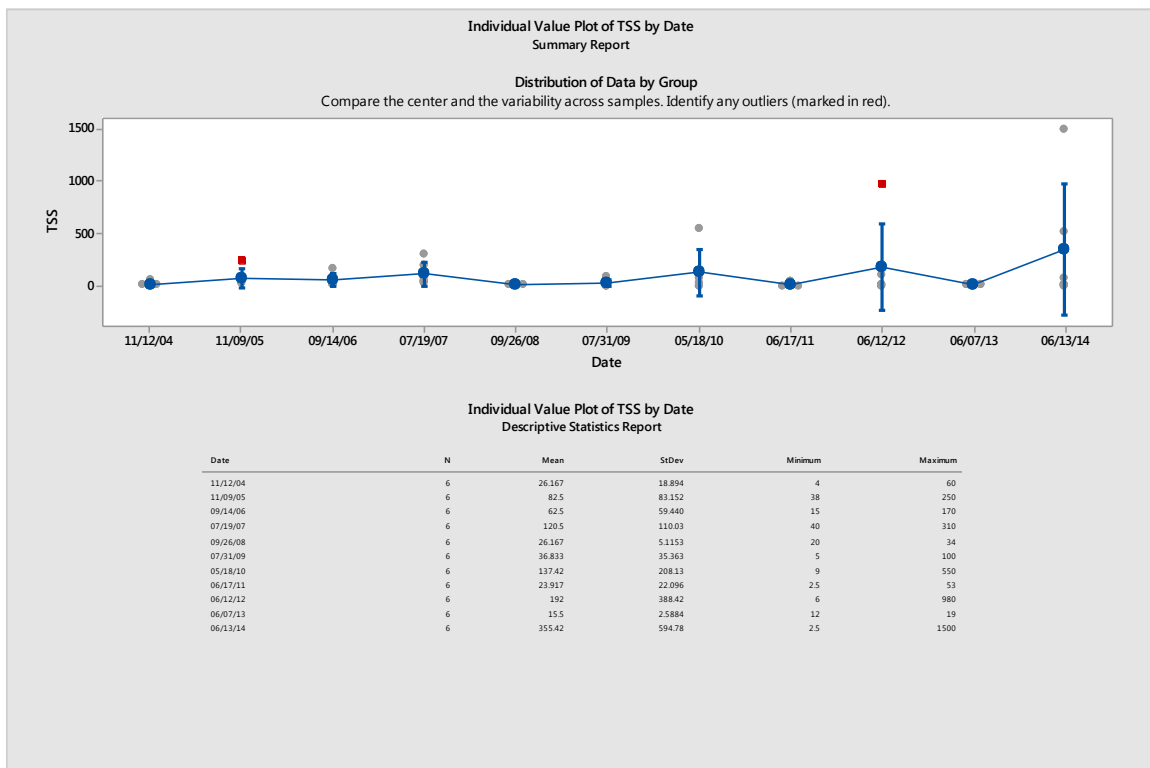


To support recreational uses of surface waters, the CT DEEP Water Quality Standards indicate that the average amount of *E. coli* found in a freshwater water body should be less than 126 CFU/100 mL and that a single sample tested for *E. coli* should be less than 235 CFU/100 mL at a designated swimming area and less than 410 CFU/100 mL in other areas. Monitoring for *E. coli* is currently required in the MS4 permit. Enterococci is another bacteria used to indicate the presence of fecal material in salt water environments. For recreation in salt water the Water Quality Standards indicate that average amount of Enterococci should be less than 35 CFU/100 mL in a designated swimming area and that a single sample tested for Enterococci should be less than 104 CFU/100 mL and in all other areas less than 500 CFU/100 mL. These targets have been included in the statewide bacteria TMDLs. In the Draft MS4 permit, *E.coli* results higher than 235 CFU/100 mL at a designated swimming area or greater than 410 CFU/100 mL in other areas requires a follow-up investigation. Individual stormwater sample results that exceed the applicable single sample maximum value for bacteria could impact water quality, so the associated outfalls should be evaluated for additional stormwater management.

## Total Suspended Solids

Total Suspended Solids (TSS) is a measurement of the amount of solids (including sand and silt) found in the stormwater sample. High concentrations of TSS can lower water quality in the receiving stream by transporting various pollutants to the waterbody where they can directly affect aquatic life or affect aquatic life by absorbing light, reducing photosynthesis, and by making the water warmer. TSS can also clog fish gills and smother fish eggs and suffocate the organisms that fish eat. TSS comes from erosion and is found in agricultural, urban and industrial runoff. TSS can be reduced by protecting land from erosion and allowing stormwater time to settle before discharging to surface waters.

### Results of annual stormwater monitoring under the MS4 general permit for TSS (mg/L) Town of Newington

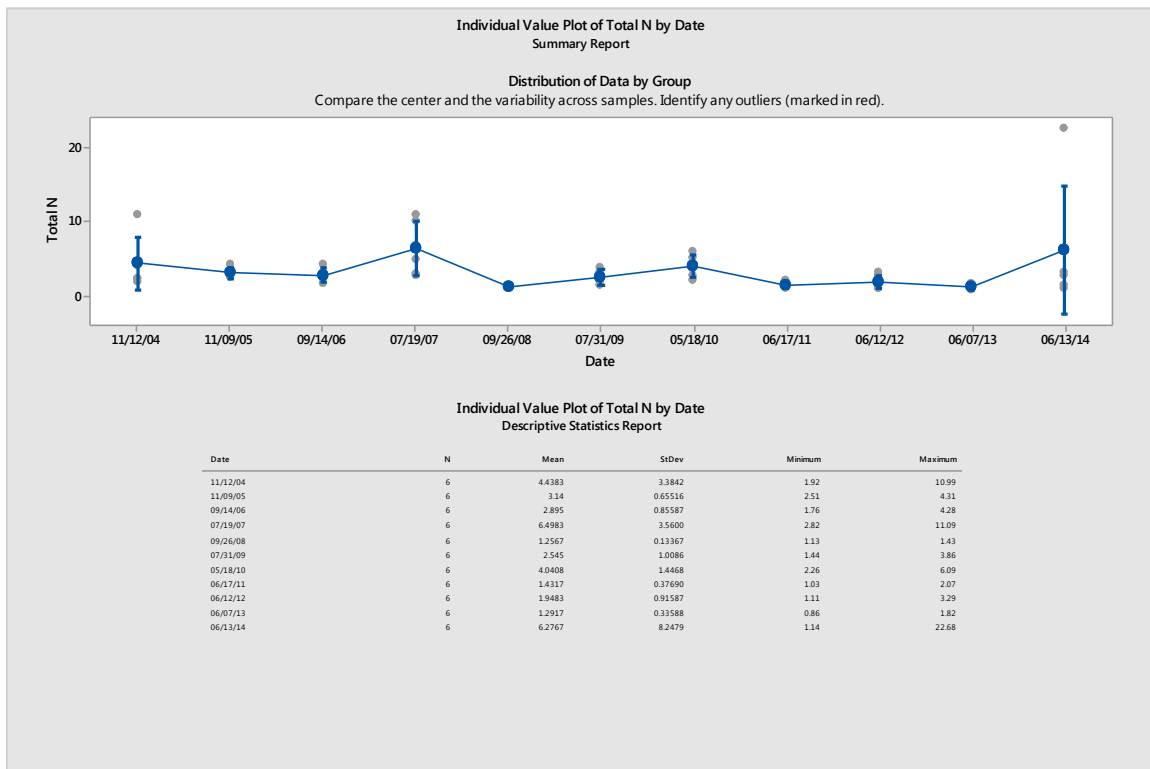


Currently, there is not a water quality based target for TSS in stormwater but TSS is a general indicator of water quality and, lower amounts of TSS are better. For comparison purposes, the average MS4 stormwater result reported for TSS by all towns covered by this permit is 48 mg/L. Areas within your town which have elevated TSS may be places to consider additional stormwater management efforts.

## Total Nitrogen

Nitrogen is an important nutrient in marine and estuarine waters such as Long Island Sound, as well as a concern in fresh water lakes and rivers. High amounts of nitrogen can lead to excessive growth of water plants and algae which then reduces the amount of oxygen available to living things in these waters. Unlawful discharges, animal waste, failing septic systems, leaves, litter and fertilizers are common sources of high nitrogen in stormwater. Responsible use of fertilizers, maintaining septic systems and proper disposal of pet waste will help reduce nitrogen in stormwater.

### Results of annual stormwater monitoring under MS4 general permit for total nitrogen (Total N mg/L) Town of Newington

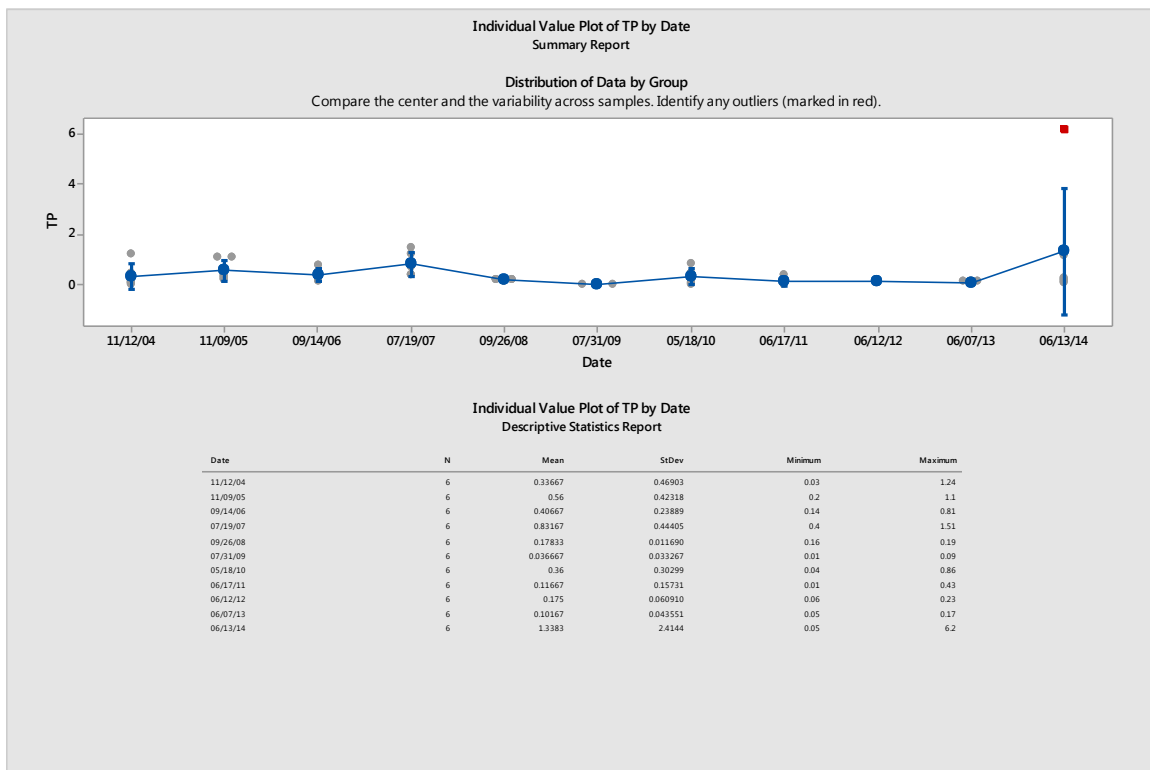


The TMDL for Long Island Sound requires a 10% reduction of nitrogen in stormwater discharges to prevent low oxygen conditions in Long Island Sound. Each town should be working to reduce the amount of nitrogen in their stormwater to address this issue. Under the current draft MS4 permit, any result for total nitrogen greater than 2.5 mg/L will require a follow-up investigation. Areas within your town which have elevated nitrogen may be places to consider additional stormwater management activities.

## Total Phosphorus

Phosphorus is an important nutrient necessary for growth in plants and animals in freshwater. Too much phosphorus in the water can throw off the balance of aquatic ecosystems causing excessive growth of water plants and algae blooms, which reduces the amount of oxygen in the water, potentially harming the fish. Sometimes these algae blooms can contain toxic forms of algae which are harmful to people and animals that come into contact with it. Sources of high phosphorus can be unlawful discharges, fertilizers, litter, leaves, erosion and animal waste.

### Results of annual stormwater monitoring under MS4 permit for total phosphorus (mg/L) Town of Newington

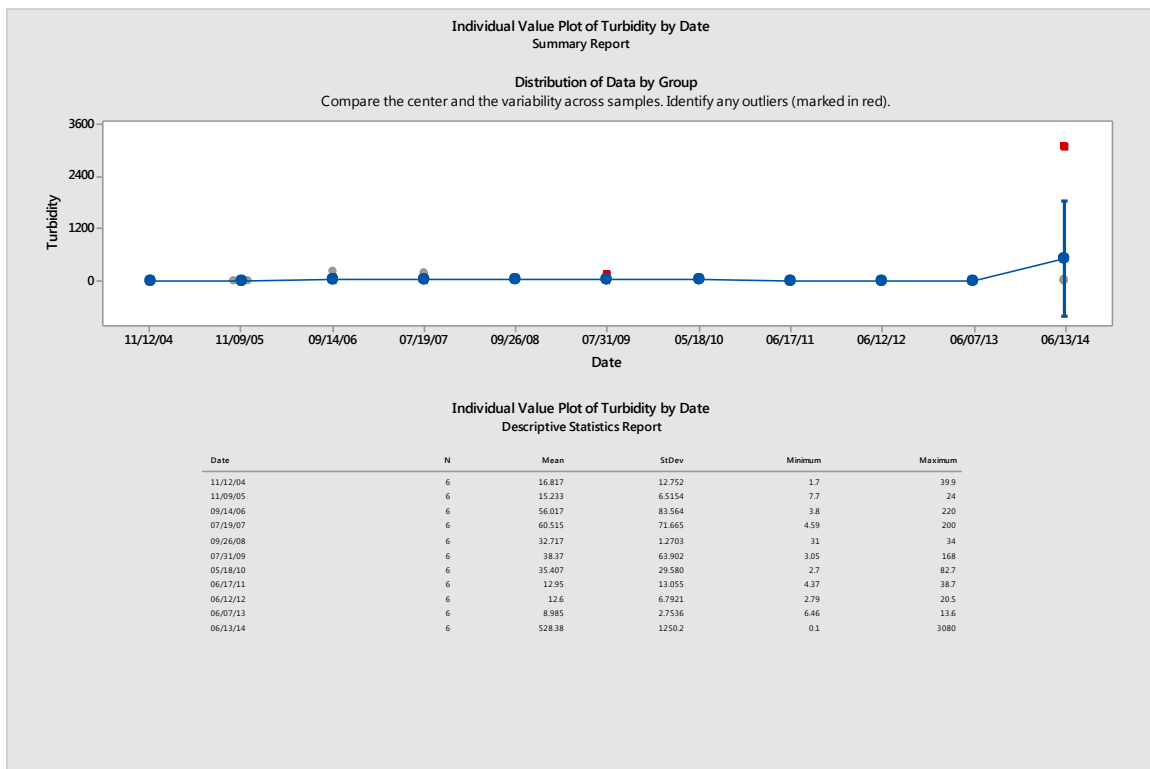


CT DEEP is actively working with many towns to reduce the amount of phosphorus reaching Connecticut's streams and rivers. Under the current draft MS4 permit, a total phosphorus result greater than 0.3 mg/L will require a follow-up investigation. Areas of your town that have elevated levels of phosphorus in the stormwater are good places to develop additional stormwater controls.

## Turbidity

Turbidity measures the clarity of the stormwater sample. It measures how much material (soil, algae, pollution, microbes etc.) is suspended in the sample. High turbidity lowers the water quality of a surface water by blocking sunlight for the plants and makes food harder for the fish to find and may be an indication of a higher amounts of other pollution in the water. Surface waters with high turbidity are visually less appealing for recreational use. High turbidity can be caused by erosion, failing septic systems, decaying plants or animals, and excessive algae growth. Turbidity is reported in Nephelometric Turbidity Units (NTU) which is related to how easily light passes through the water sample.

### Results of annual stormwater monitoring under MS4 permit for turbidity (NTU) Town of Newington



The Water Quality Standards have a criterion that indicates turbidity should not to exceed 5 NTU above ambient levels. In the draft MS4 permit, a turbidity result greater than 5 NTU over in-stream conditions will require a follow-up investigation. While there is not a fixed statewide criterion for turbidity, lower results are better for the health of the surface waters in town. Areas with higher levels of turbidity in stormwater would be a good place to develop additional stormwater controls.

## Town Maps

The following maps were created to show the impervious cover (IC) in your town as well as the water quality in the rivers, streams, lakes and estuaries in and around your town.

### *Impervious Cover on the Town Maps*

IC is shown in red on the maps. Dark red areas indicate a higher percentage of IC, lighter red areas have less IC, while the grey areas indicate very little or no IC.

### *Water Quality on the Town Maps*

Separate maps are provided for the different uses of the waterbodies such as Aquatic Life Uses, Recreation, and Shellfishing (in coastal towns). The waterbodies are colored to show the health of the waterbody. Green means that the waterbody meets the water quality requirements to fully support the specified use. Yellow means that water quality is poor and that the specified use is not met. Blue means that there is not enough information to know whether or not water quality is good or bad to support the specified use. Additionally, a small map is provided on the left side of each larger map to show which watersheds are within your town.



# Waters Designated For Aquatic Life in the Town of Newington

Percent Impervious Cover	Designated For Aquatic Life
0-11%	Fully Supporting
12-25%	Not Supporting
26-50%	Unassessed
51-75%	
76-100%	

## Subregional Basins

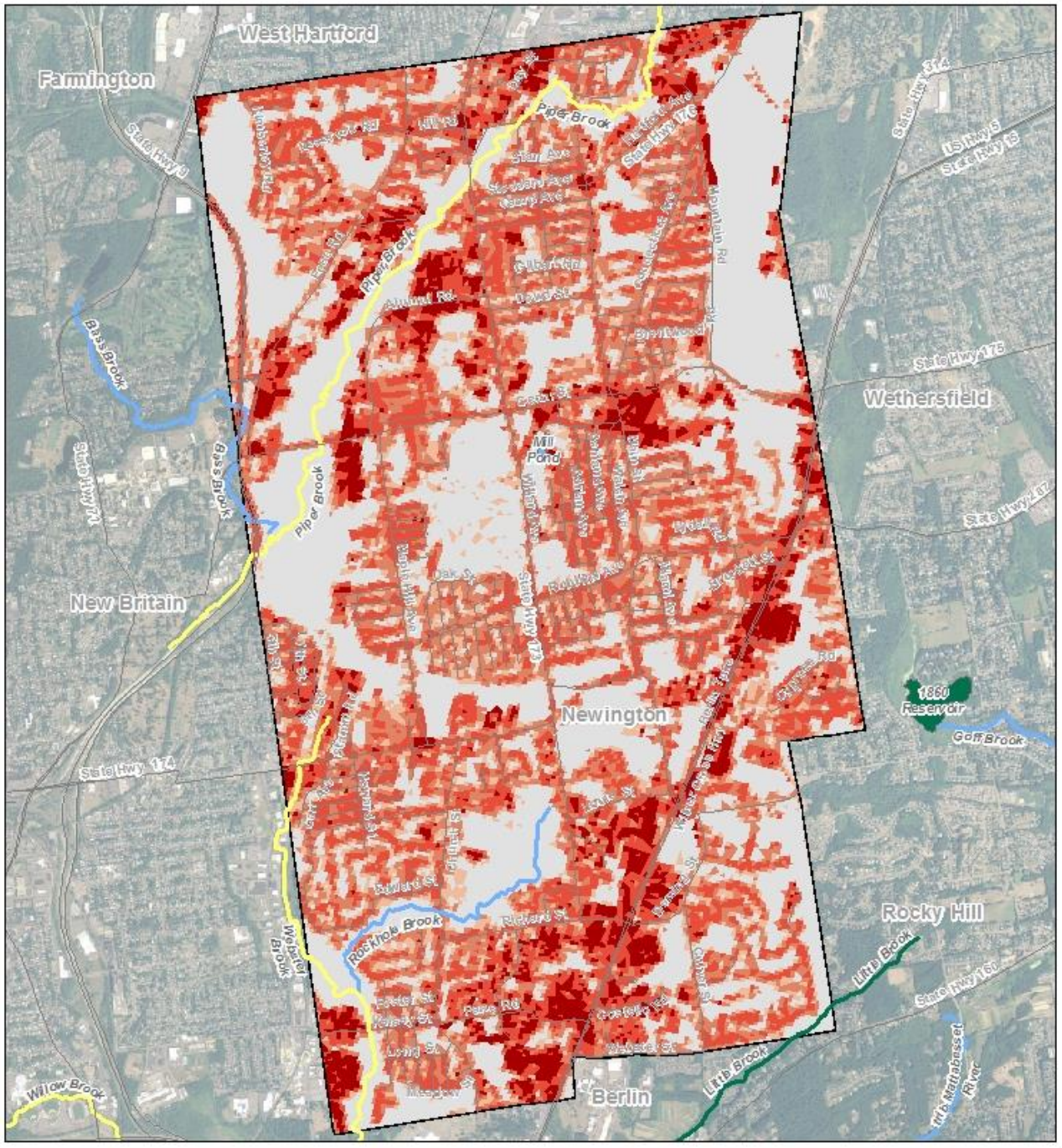


Bass Brook	Piper Brook
Goff Brook	Trout Brook
Mattabesset River	Webster Brook
Park River	



These maps were created using the National Land Cover Database (NLCD) 2011 Impervious Cover Percent Data. For more detail please review the metadata document.

Impervious cover (IC) refers to hard surfaces across the landscape such as pavement or buildings. These hard surfaces do not absorb water and prevent rain from soaking in to the ground. As a result, runoff occurs and easily carries pollutants to nearby lakes and streams.



## Waters Designated For Recreation in the Town of Newington



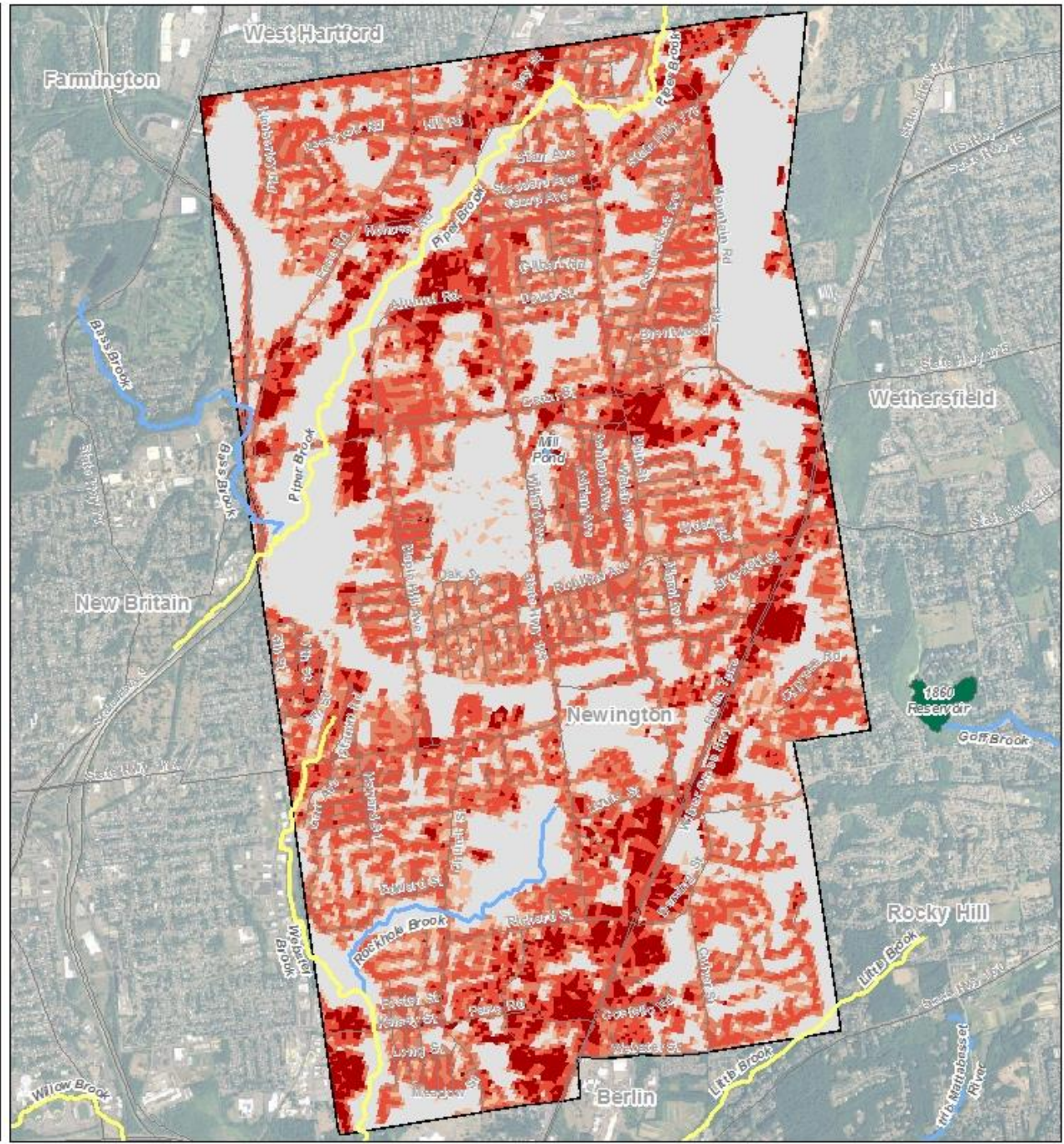
### Subregional Basins



0 0.45 0.9 Miles

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## **Factsheet: Town of Newtown Water Quality and Stormwater Summary**

This document was created for each town that has submitted monitoring data under the current Small Municipal Separate Storm Sewer System (MS4) General Permit. What follows is information on how stormwater can affect water quality in streams and rivers and a summary of data submitted by your town. This factsheet is intended to help you interpret your monitoring results and assist you in compliance with the MS4 program.

### Water Quality in Connecticut

Surface waters are important resources that support numerous uses, including water supply, recreation, fishing, shellfishing and sustaining aquatic life. Water quality conditions needed to support these uses are identified within the Connecticut Water Quality Standards (WQS). In order to protect and restore these uses, we need acceptable environmental conditions (physical, chemical and biological) to be present within surface waters.

To assess and track water quality conditions, CT DEEP conducts monitoring across the State. The data is synthesized into a biennial state water quality report called the Integrated Water Quality Report. Currently, specific water quality monitoring in the state encompasses about 50% of rivers, 47% of lakes, and 100% of estuary/coastline. In addition, CT DEEP may have information about certain land uses or discharges which could indicate a potential for water quality to be impacted, even if the waterbody has not been fully monitored and assessed.

To find more detailed information on water quality in your town, please see the Integrated Water Quality Report (IWQR) on the CT DEEP website at [www.ct.gov/deep/iwqr](http://www.ct.gov/deep/iwqr). Information on water quality within your town is also presented on the maps included in this fact sheet.

### Impacts of Impervious Cover on Water Quality

Impervious cover (IC) refers to hard surfaces across the landscape such as roads, sidewalks, parking lots and roofs. Studies have focused on the amount of hard surfaces to evaluate the impacts of stormwater runoff from these hard surfaces on water quality and found that IC affects both the quantity and quality of stormwater. IC forces rain to runoff the land, carrying pollutants quickly and directly to lakes and streams instead of soaking into the ground and being filtered by the soil. For more information on impervious cover, please see the CT DEEP web page [www.ct.gov/deep/imperviouscoverstudies](http://www.ct.gov/deep/imperviouscoverstudies) and EPA's web page [www.epa.gov/caddis/ssr\\_urb\\_isl.html](http://www.epa.gov/caddis/ssr_urb_isl.html).

In general, the higher the percentage of IC in a watershed, the poorer the surface water quality. Research in Connecticut strongly suggests that aquatic life will be harmed when the IC within a

watershed exceeds 12%. Stormwater pollution from IC is a likely cause of impairment for these waterbodies.

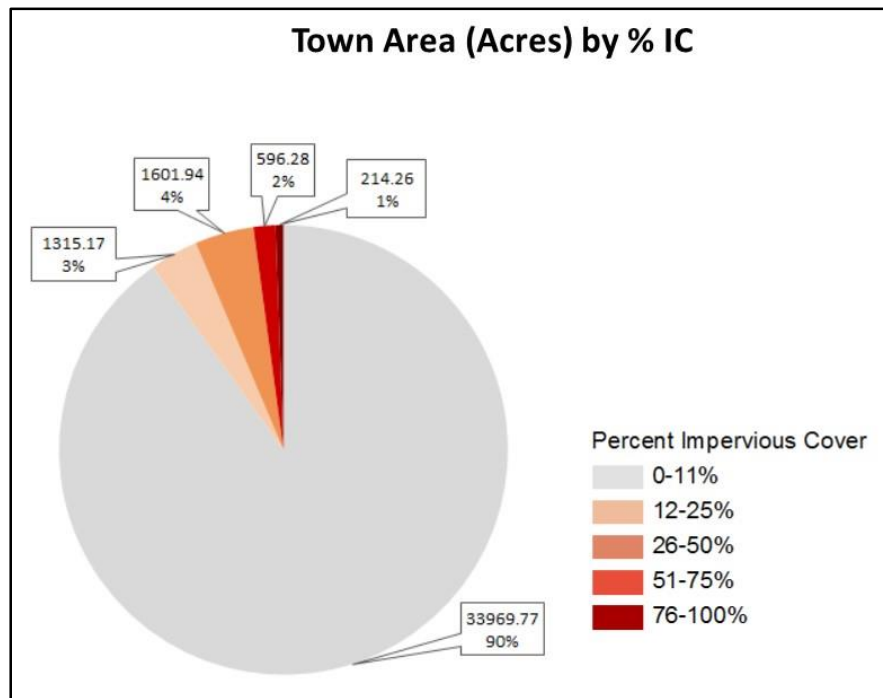
### Town of Newtown: Impervious Cover Data

This chart shows the amount of area within your town that contains IC. Data is grouped by acres and percent IC. While all levels of IC can contribute stormwater to streams, it is important to note that land with IC greater than 12% in town is likely to be contributing enough stormwater to streams to have a negative impact on water quality.

Towns should aim to make stormwater improvements in areas with IC greater than 12% in an effort to reduce the amount of stormwater pollution reaching surface waters which will protect and improve water quality.

For more information on areas of impervious cover within your town, please see the maps at the back of this factsheet.

Amounts of Impervious Cover within the Town of Newtown



### Pollution Reduction

Waterbodies often can handle a certain amount of pollutants and still maintain good water quality. However, impaired waterbodies have too much pollution impacting their water quality and therefore the streams do not support all uses for the waterbody. Total Maximum Daily Loads (TMDLs) are pollution reduction budgets developed for impaired waterbodies in order to meet

water quality. If the pollution budget is achieved through the recommended pollution reduction measures, then the waterbody is expected to meet water quality. CT DEEP also supports impaired waters restoration through watershed based plans ([www.ct.gov/deep/watershed](http://www.ct.gov/deep/watershed)) which provide more specific non-point source pollution control measures. The following TMDLs or pollution reduction strategies have been developed and apply to areas within your town.

TMDLs or Strategies Applicable to the Town of Newtown

<b>Name of TMDL or Strategy</b>	<b>Pollutant</b>	<b>Waterbody Name</b>	<b>Link</b>
Statewide Bacteria TMDL	Bacteria	Housatonic River / Lake Zoar / Lake Housatonic / Curtiss Brook	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/housatonicriver6000.pdf">www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/housatonicriver6000.pdf</a>
Statewide Bacteria TMDL	Bacteria	Pequonnock River / West Branch Pequonnock River	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/pequonnockriver7105.pdf">www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/pequonnockriver7105.pdf</a>
A TMDL Analysis for Recreational Uses of the Deep Brook Sub-Regional Basin	Bacteria	Deep Brook	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/deepbrookfinal.pdf">www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/deepbrookfinal.pdf</a>
TMDL Analysis for Limekiln Brook, Danbury, CT	Copper, Zinc, Ammonia, & Chlorine	Limekiln Brook	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/limekilnbrooktmdl.pdf">www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/limekilnbrooktmdl.pdf</a>
A TMDL Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound	Nitrogen	Long Island Sound and contributing watersheds	<a href="http://www.ct.gov/deep/lib/deep/water/lis_water_quality/nitrogen_control_program/tmdl.pdf">www.ct.gov/deep/lib/deep/water/lis_water_quality/nitrogen_control_program/tmdl.pdf</a>
Northeast Regional Mercury TMDL	Mercury	All CT Inland waters	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/ne_hg_tmdl.pdf">www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/ne_hg_tmdl.pdf</a>
Interim Phosphorus Reduction Strategy	Phosphorus	Certain CT Inland waters	<a href="http://www.ct.gov/deep/lib/deep/water/water_quality_standards/p/interimmngntphosstrat_042614.pdf">www.ct.gov/deep/lib/deep/water/water_quality_standards/p/interimmngntphosstrat_042614.pdf</a>

For more information on these TMDLs or strategies please go to our website [www.ct.gov/deep/tmdl](http://www.ct.gov/deep/tmdl).

## Stormwater Quality Monitoring

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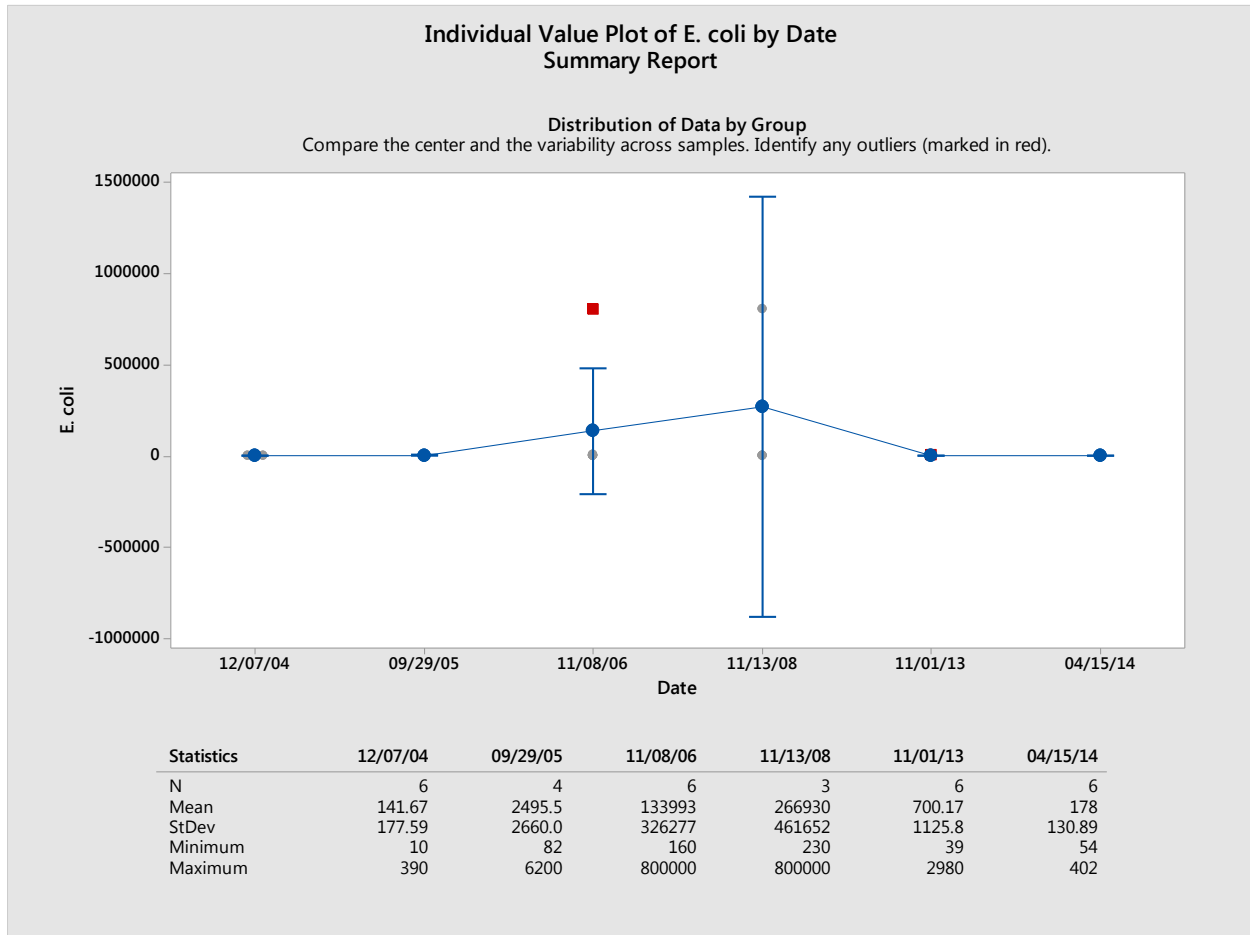
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## Bacteria

*Escherichia coli* (*E. coli*) is a bacteria that lives in the intestines of humans and other warm-blooded animals and is used to indicate the presence of fecal matter in surface waters. Some strains of *E. coli* and other pathogens found in fecal material cause serious illness in people coming in contact with it. For this reason, high amounts of bacteria will cause authorities to close beaches for swimming. Bacteria is measured as the number of colony forming units, or CFU, per 100 ml of water. Any result that was reported as “to numerous to count” is included on the chart as 800,000 CFU/100 mL.

Results of annual stormwater monitoring under MS4 permit for *E.coli* (CFU/ 100 mL of sample)  
Town of Newtown

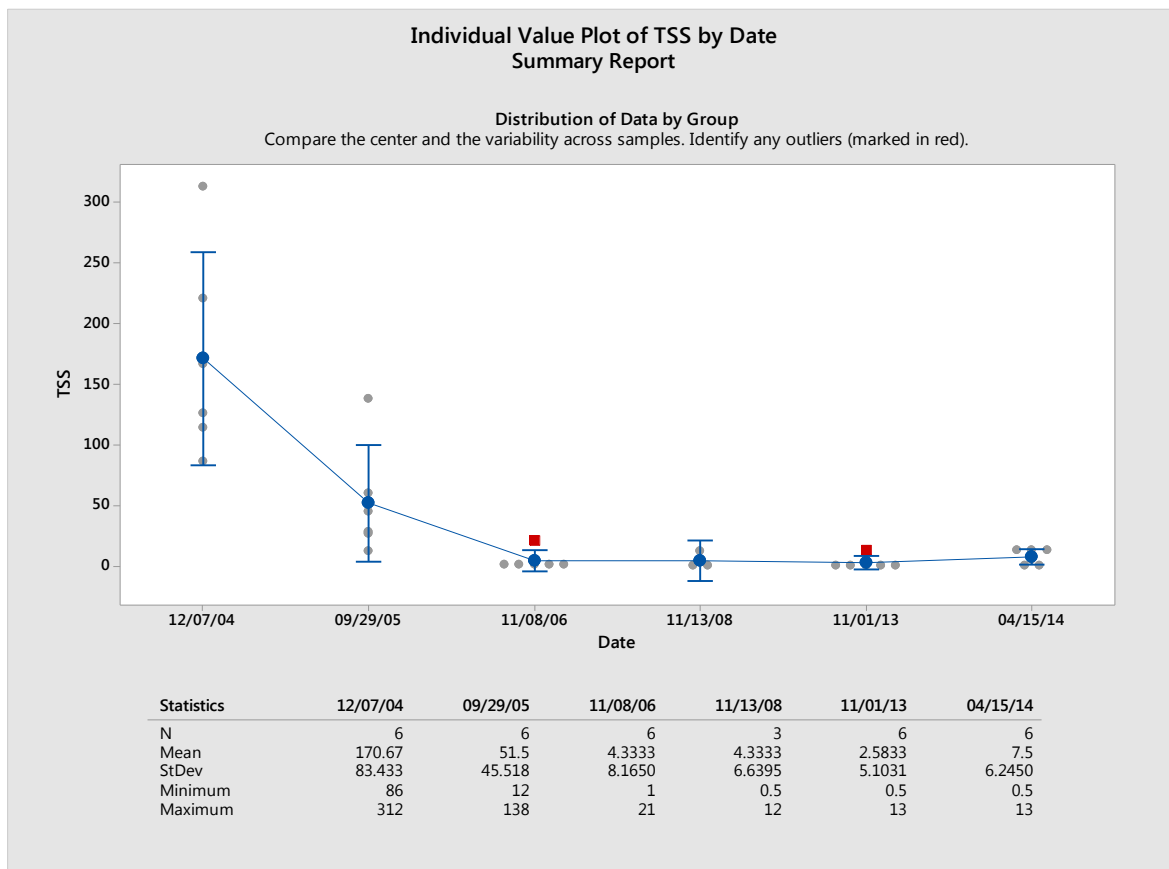


To support recreational uses of surface waters, the CT DEEP Water Quality Standards indicate that the average amount of *E. coli* found in a freshwater water body should be less than 126 CFU/100 mL and that a single sample tested for *E. coli* should be less than 235 CFU/100 mL at a designated swimming area and less than 410 CFU/100 mL in other areas. Monitoring for *E. coli* is currently required in the MS4 permit. Enterococci is another bacteria used to indicate the presence of fecal material in salt water environments. For recreation in salt water the Water Quality Standards indicate that average amount of Enterococci should be less than 35 CFU/100 mL in a designated swimming area and that a single sample tested for Enterococci should be less than 104 CFU/100 mL and in all other areas less than 500 CFU/100 mL. These targets have been included in the statewide bacteria TMDLs. In the Draft MS4 permit, *E.coli* results higher than 235 CFU/100 mL at a designated swimming area or greater than 410 CFU/100 mL in other areas requires a follow-up investigation. Individual stormwater sample results that exceed the applicable single sample maximum value for bacteria could impact water quality, so the associated outfalls should be evaluated for additional stormwater management.

## Total Suspended Solids

Total Suspended Solids (TSS) is a measurement of the amount of solids (including sand and silt) found in the stormwater sample. High concentrations of TSS can lower water quality in the receiving stream by transporting various pollutants to the waterbody where they can directly affect aquatic life or affect aquatic life by absorbing light, reducing photosynthesis, and by making the water warmer. TSS can also clog fish gills and smother fish eggs and suffocate the organisms that fish eat. TSS comes from erosion and is found in agricultural, urban and industrial runoff. TSS can be reduced by protecting land from erosion and allowing stormwater time to settle before discharging to surface waters.

### Results of annual stormwater monitoring under the MS4 general permit for TSS (mg/L) Town of Newtown



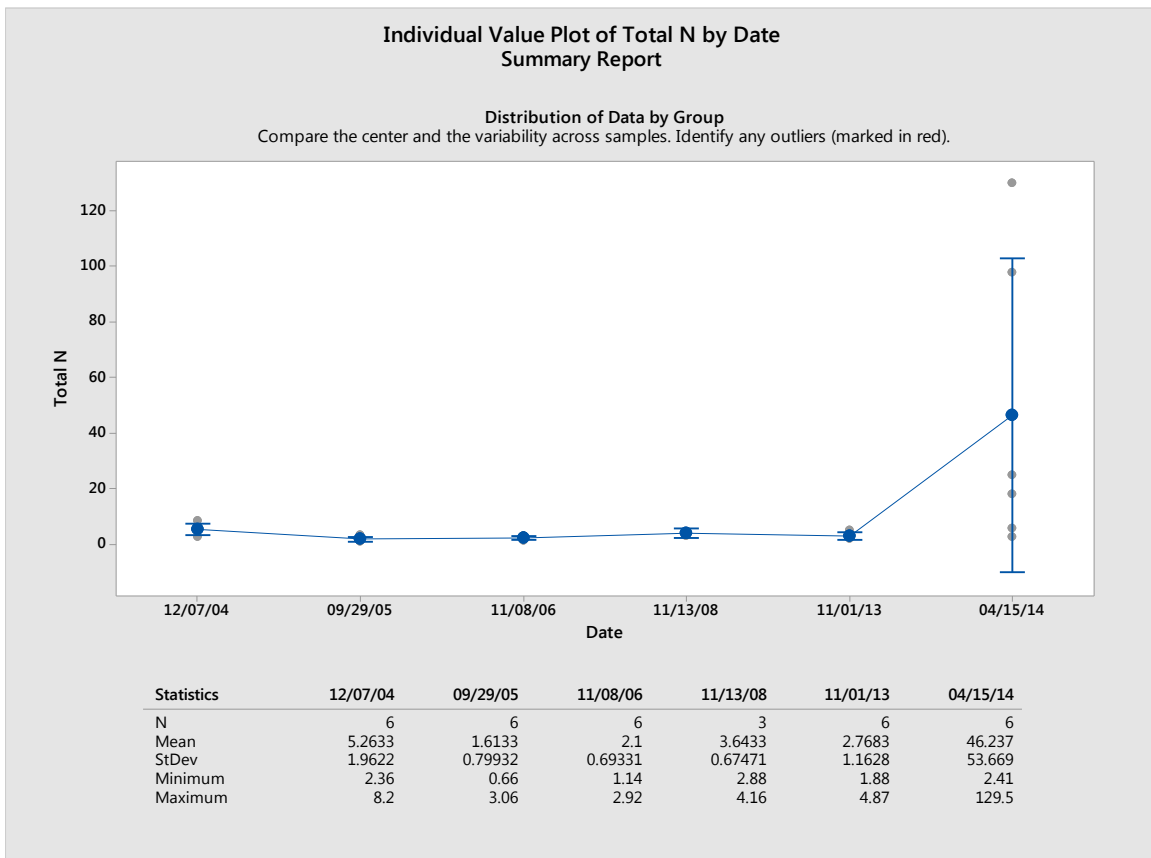
Currently, there is not a water quality based target for TSS in stormwater but TSS is a general indicator of water quality and, lower amounts of TSS are better. For comparison purposes, the average MS4 stormwater result reported for TSS by all towns covered by this permit is 48 mg/L. Areas within your town which have elevated TSS may be places to consider additional stormwater management efforts.



## Total Nitrogen

Nitrogen is an important nutrient in marine and estuarine waters such as Long Island Sound, as well as a concern in fresh water lakes and rivers. High amounts of nitrogen can lead to excessive growth of water plants and algae which then reduces the amount of oxygen available to living things in these waters. Unlawful discharges, animal waste, failing septic systems, leaves, litter and fertilizers are common sources of high nitrogen in stormwater. Responsible use of fertilizers, maintaining septic systems and proper disposal of pet waste will help reduce nitrogen in stormwater.

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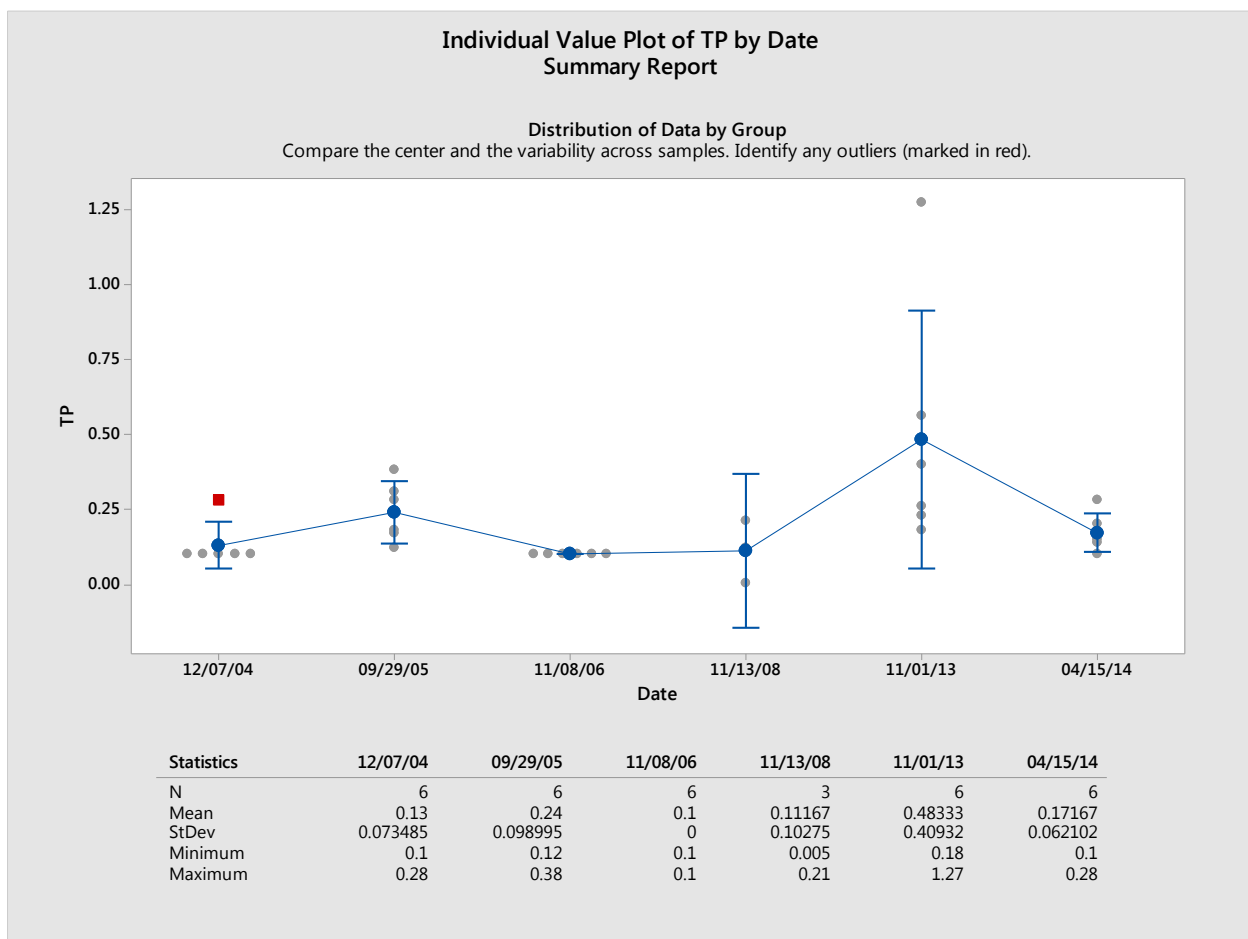


The TMDL for Long Island Sound requires a 10% reduction of nitrogen in stormwater discharges to prevent low oxygen conditions in Long Island Sound. Each town should be working to reduce the amount of nitrogen in their stormwater to address this issue. Under the current draft MS4 permit, any result for total nitrogen greater than 2.5 mg/L will require a follow-up investigation. Areas within your town which have elevated nitrogen may be places to consider additional stormwater management activities.

## Total Phosphorus

Phosphorus is an important nutrient necessary for growth in plants and animals in freshwater. Too much phosphorus in the water can throw off the balance of aquatic ecosystems causing excessive growth of water plants and algae blooms, which reduces the amount of oxygen in the water, potentially harming the fish. Sometimes these algae blooms can contain toxic forms of algae which are harmful to people and animals that come into contact with it. Sources of high phosphorus can be unlawful discharges, fertilizers, litter, leaves, erosion and animal waste.

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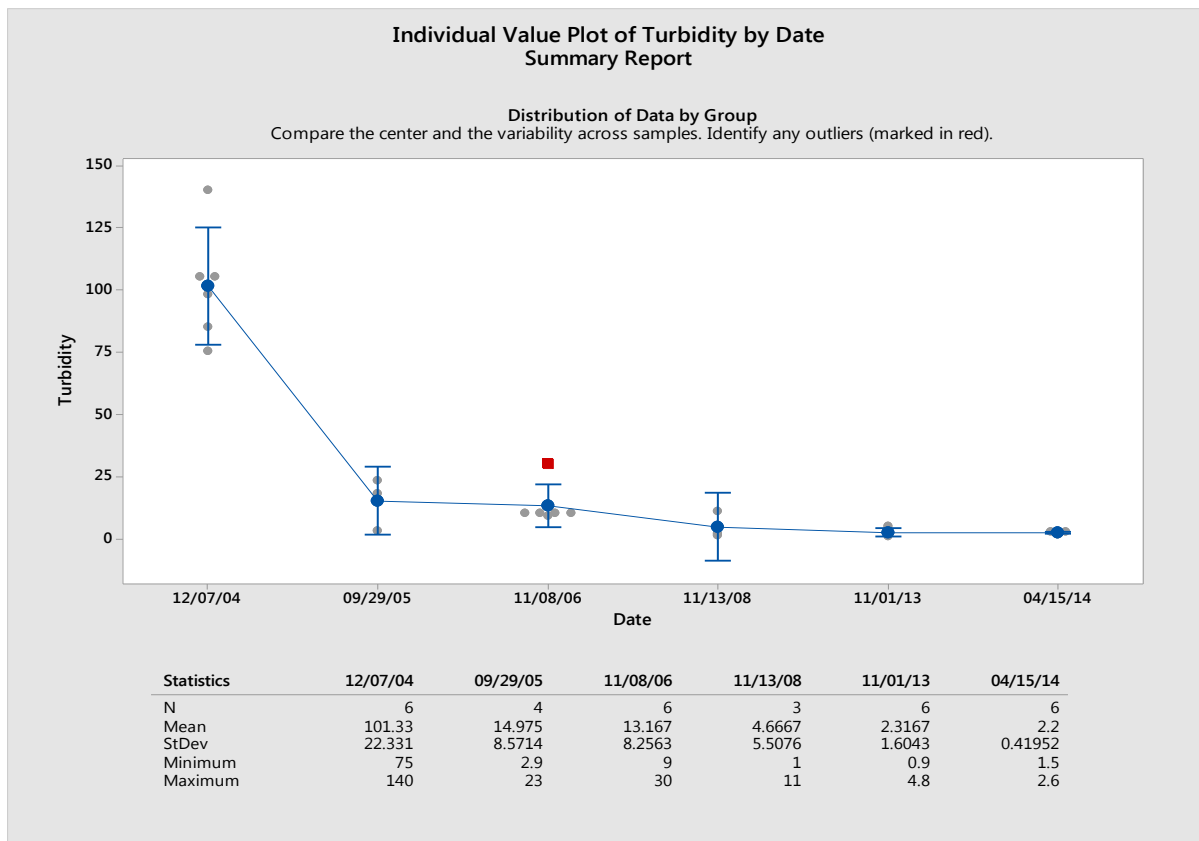


CT DEEP is actively working with many towns to reduce the amount of phosphorus reaching Connecticut's streams and rivers. Under the current draft MS4 permit, a total phosphorus result greater than 0.3 mg/L will require a follow-up investigation. Areas of your town that have elevated levels of phosphorus in the stormwater are good places to develop additional stormwater controls.

## Turbidity

Turbidity measures the clarity of the stormwater sample. It measures how much material (soil, algae, pollution, microbes etc.) is suspended in the sample. High turbidity lowers the water quality of a surface water by blocking sunlight for the plants and makes food harder for the fish to find and may be an indication of a higher amounts of other pollution in the water. Surface waters with high turbidity are visually less appealing for recreational use. High turbidity can be caused by erosion, failing septic systems, decaying plants or animals, and excessive algae growth. Turbidity is reported in Nephelometric Turbidity Units (NTU) which is related to how easily light passes through the water sample.

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# Waters Designated For Aquatic Life in the Town of Newtown

Percent Impervious Cover	Designated For Aquatic Life
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12-25%	Not Supporting
26-50%	Unassessed
51-75%	
76-100%	

## Subregional Basins

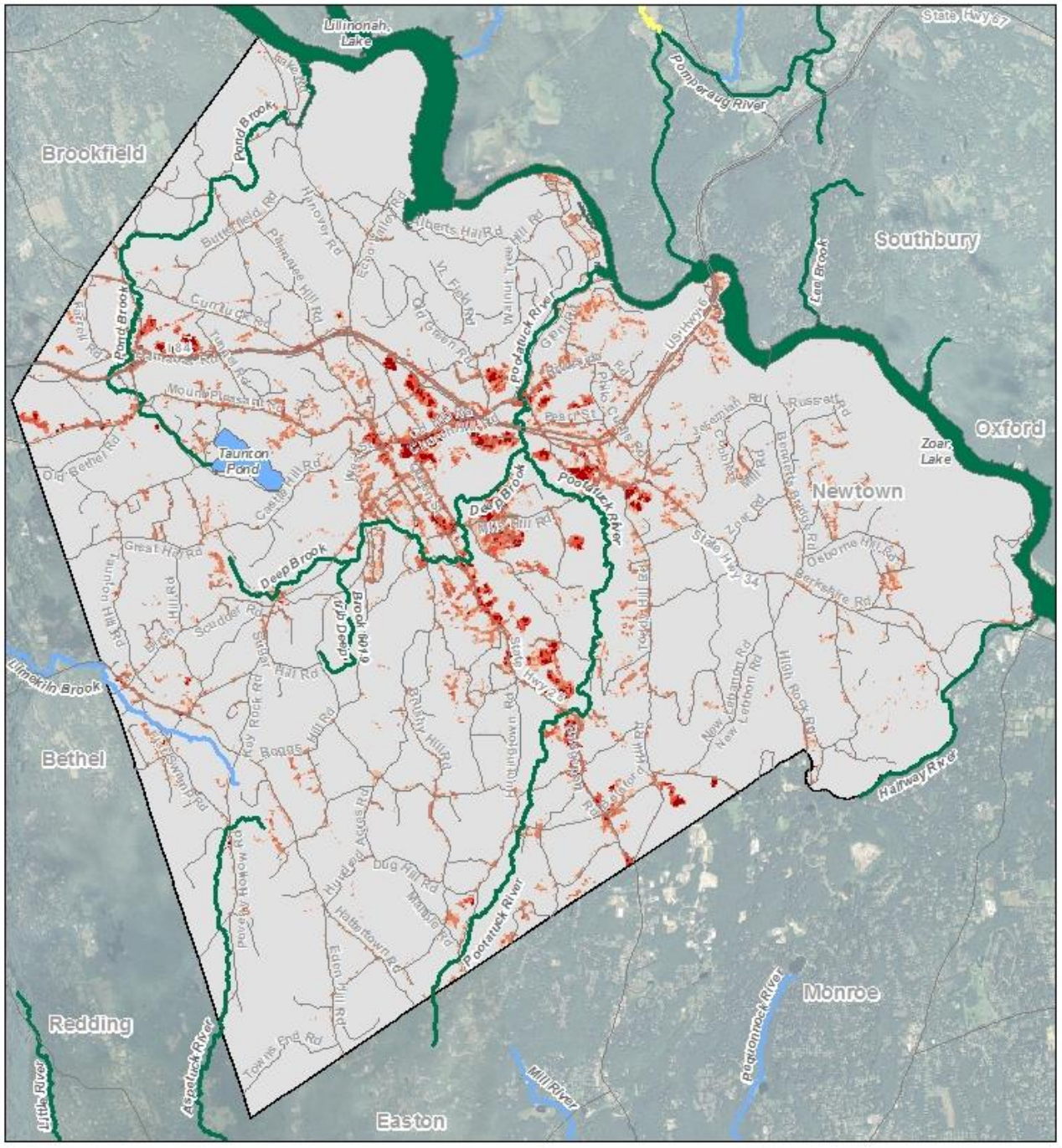


Aspetuck River	Limekiln Brook
Deep Brook	Pequonnock River
Halfway River	Pond Brook
Housatonic River	Pootatuck River

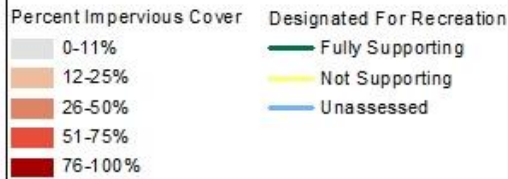


These maps were created using the National Land Cover Database (NLCD) 2011 Impervious Cover Percent Data. For more detail please review the metadata document.

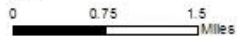
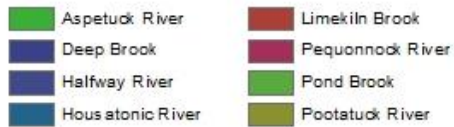
Impervious cover (IC) refers to hard surfaces across the landscape such as pavement or buildings. These hard surfaces do not absorb water and prevent rain from soaking in to the ground. As a result, runoff occurs and easily carries pollutants to nearby lakes and streams.



# Waters Designated For Recreation in the Town of Newtown

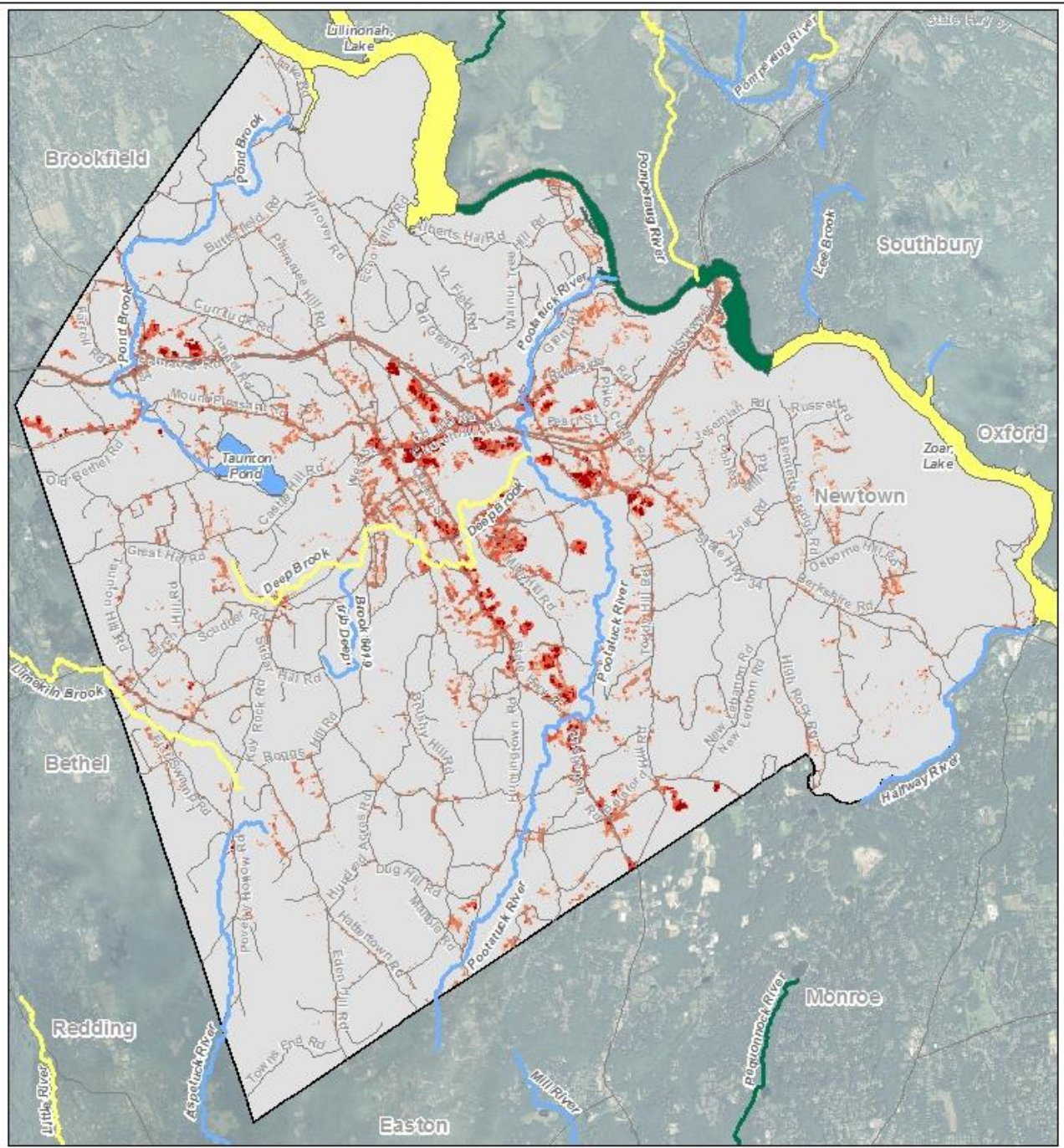


## Subregional Basins



These maps were created using the National Land Cover Database (NLCD) 2011 Impervious Cover Percent Data. For more detail please review the metadata document.

Impervious cover (IC) refers to hard surfaces across the landscape such as pavement or buildings. These hard surfaces do not absorb water and prevent rain from soaking in to the ground. As a result, runoff occurs and easily carries pollutants to nearby lakes and streams.



## **Factsheet: Town of North Branford Water Quality and Stormwater Summary**

This document was created for each town that has submitted monitoring data under the current Small Municipal Separate Storm Sewer System (MS4) General Permit. What follows is information on how stormwater can affect water quality in streams and rivers and a summary of data submitted by your town. This factsheet is intended to help you interpret your monitoring results and assist you in compliance with the MS4 program.

### Water Quality in Connecticut

Surface waters are important resources that support numerous uses, including water supply, recreation, fishing, shellfishing and sustaining aquatic life. Water quality conditions needed to support these uses are identified within the Connecticut Water Quality Standards (WQS). In order to protect and restore these uses, we need acceptable environmental conditions (physical, chemical and biological) to be present within surface waters.

To assess and track water quality conditions, CT DEEP conducts monitoring across the State. The data is synthesized into a biennial state water quality report called the Integrated Water Quality Report. Currently, specific water quality monitoring in the state encompasses about 50% of rivers, 47% of lakes, and 100% of estuary/coastline. In addition, CT DEEP may have information about certain land uses or discharges which could indicate a potential for water quality to be impacted, even if the waterbody has not been fully monitored and assessed.

To find more detailed information on water quality in your town, please see the Integrated Water Quality Report (IWQR) on the CT DEEP website at [www.ct.gov/dep/iwqr](http://www.ct.gov/dep/iwqr). Information on water quality within your town is also presented on the maps included in this fact sheet.

### Impacts of Impervious Cover on Water Quality

Impervious cover (IC) refers to hard surfaces across the landscape such as roads, sidewalks, parking lots and roofs. Studies have focused on the amount of hard surfaces to evaluate the impacts of stormwater runoff from these hard surfaces on water quality and found that IC affects both the quantity and quality of stormwater. IC forces rain to runoff the land, carrying pollutants quickly and directly to lakes and streams instead of soaking into the ground and being filtered by the soil. For more information on impervious cover, please see the CT DEEP web page [www.ct.gov/deep/imperviouscoverstudies](http://www.ct.gov/deep/imperviouscoverstudies) and EPA's web page [www.epa.gov/caddis/ssr\\_urb\\_isl.html](http://www.epa.gov/caddis/ssr_urb_isl.html).

In general, the higher the percentage of IC in a watershed, the poorer the surface water quality. Research in Connecticut strongly suggests that aquatic life will be harmed when the IC within a

watershed exceeds 12%. Stormwater pollution from IC is a likely cause of impairment for these waterbodies.

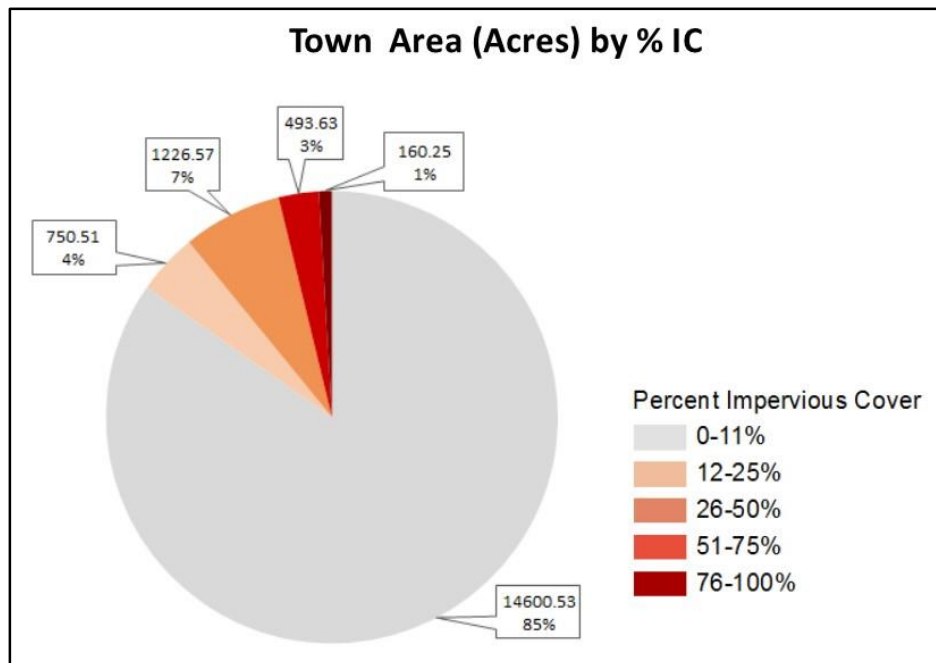
### Town of North Branford: Impervious Cover Data

This chart shows the amount of area within your town that contains IC. Data is grouped by acres and percent IC. While all levels of IC can contribute stormwater to streams, it is important to note that land with IC greater than 12% in town is likely to be contributing enough stormwater to streams to have a negative impact on water quality.

Towns should aim to make stormwater improvements in areas with IC greater than 12% in an effort to reduce the amount of stormwater pollution reaching surface waters which will protect and improve water quality.

For more information on areas of impervious cover within your town, please see the maps at the back of this factsheet.

Amounts of Impervious Cover within the Town of North Branford



### Pollution Reduction

Waterbodies often can handle a certain amount of pollutants and still maintain good water quality. However, impaired waterbodies have too much pollution impacting their water quality and therefore the streams do not support all uses for the waterbody. Total Maximum Daily Loads (TMDLs) are pollution reduction budgets developed for impaired waterbodies in order to meet water quality. If the pollution budget is achieved through the recommended pollution reduction



measures, then the waterbody is expected to meet water quality. CT DEEP also supports impaired waters restoration through watershed based plans ([www.ct.gov/deep/watershed](http://www.ct.gov/deep/watershed)) which provide more specific non-point source pollution control measures. The following TMDLs or pollution reduction strategies have been developed and apply to areas within your town.

TMDLs or Strategies Applicable to the Town of North Branford

<b>Name of TMDL or Strategy</b>	<b>Pollutant</b>	<b>Waterbody Name</b>	<b>Link</b>
Statewide Bacteria TMDL	Bacteria	Farm River	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/farmriver5112.pdf">www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/farmriver5112.pdf</a>
Statewide Bacteria TMDL	Bacteria	Coginchaug River / Laurel Brook / Wadsworth Falls Pond / Lyman Meadows Brook	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/coginchaugriver4607.pdf">www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/coginchaugriver4607.pdf</a>
A TMDL Analysis for Cedar Pond in North Branford, CT	Phosphorus	Cedar Pond	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/cedarfinaltmdl.pdf">www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/cedarfinaltmdl.pdf</a>
A TMDL Analysis for Linsley Pond in North Branford and Branford, CT	Phosphorus	Linsley Pond	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/linsleyfinaltmdl.pdf">www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/linsleyfinaltmdl.pdf</a>
A TMDL Analysis for the Mattabeset River Regional Basin	Bacteria	Mattabeset River / John Hall Brook / Little Brook / Spruce Brook / Coles Brook / Miner Brook / Willow Brook 4600 / Belcher Brook / Webster Brook / Sawmill Brook / Coginchaug River / Willow Brook 4602	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/mattbasintmdlfinal.pdf">www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/mattbasintmdlfinal.pdf</a>
Statewide Bacteria TMDL	Bacteria	West River and Edgewood Park Pond	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/westriver5305.pdf">www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/westriver5305.pdf</a>
A TMDL Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound	Nitrogen	Long Island Sound and contributing watersheds	<a href="http://www.ct.gov/deep/lib/deep/water/lis_water_quality/nitrogen_control_program/tmdl.pdf">www.ct.gov/deep/lib/deep/water/lis_water_quality/nitrogen_control_program/tmdl.pdf</a>
Northeast Regional Mercury TMDL	Mercury	All CT Inland waters	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/ne_hg_tmdl.pdf">www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/ne_hg_tmdl.pdf</a>

For more information on these TMDLs or strategies please go to our website [www.ct.gov/deep/tmdl](http://www.ct.gov/deep/tmdl).

### Stormwater Quality Monitoring

Regular monitoring for targeted pollutants in stormwater provides an indication of potential for water quality impacts and helps identify sources and unlawful discharges. Annual monitoring at 6 locations from different areas of town has been a requirement of the MS4 permit since 2004. CT DEEP uses that information to evaluate the quality of stormwater and the potential for impacts to surface waters as well as to make sure that stormwater is managed properly.

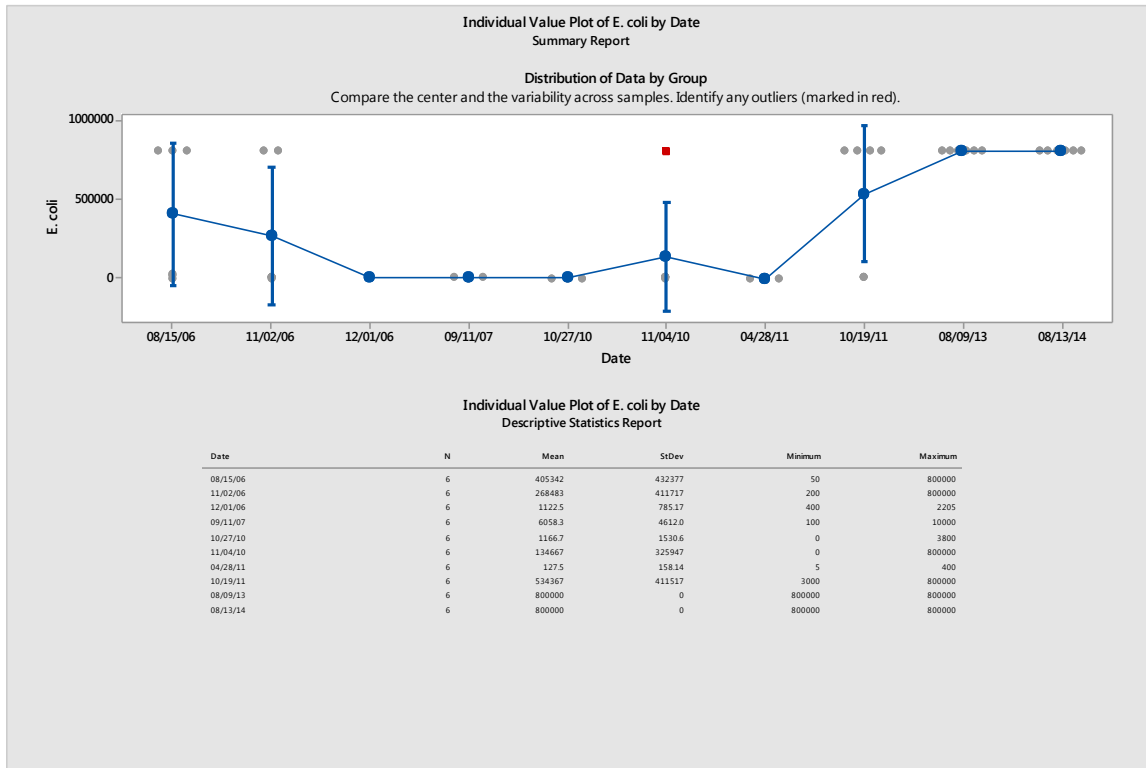
Below are 5 graphs tracking stormwater results submitted by your town for 5 parameters reported under the current MS4 General Permit. The results of each stormwater test submitted to CT DEEP by your town is shown. Individual sample results are shown in grey while the average of the samples collected on a particular day is shown in blue, with a line connecting the averages for the various sample dates. The bars show the statistical range of samples for each day with the red squares showing results which are considered to be outliers, that is, very different from the other samples collected on that day. The chart on the graph lists the sample dates and some basic statistics:

<b>Statistic</b>	<b>Description</b>
N	Number of stormwater samples collected on that date
Mean	Average of the results reported for that sample date
Standard Deviation (StdDev)	A measure of the variability of the results for the sample date
Minimum	The lowest sample result for the sample date
Maximum	The highest sample result for the sample date

### Bacteria

*Escherichia coli* (*E. coli*) is a bacteria that lives in the intestines of humans and other warm-blooded animals and is used to indicate the presence of fecal matter in surface waters. Some strains of *E. coli* and other pathogens found in fecal material cause serious illness in people coming in contact with it. For this reason, high amounts of bacteria will cause authorities to close beaches for swimming. Bacteria is measured as the number of colony forming units, or CFU, per 100 ml of water. Any result that was reported as “to numerous to count” is included on the chart as 800,000 CFU/100 mL.

Results of annual stormwater monitoring under MS4 permit for *E.coli* (CFU/ 100 mL of sample)  
Town of North Branford

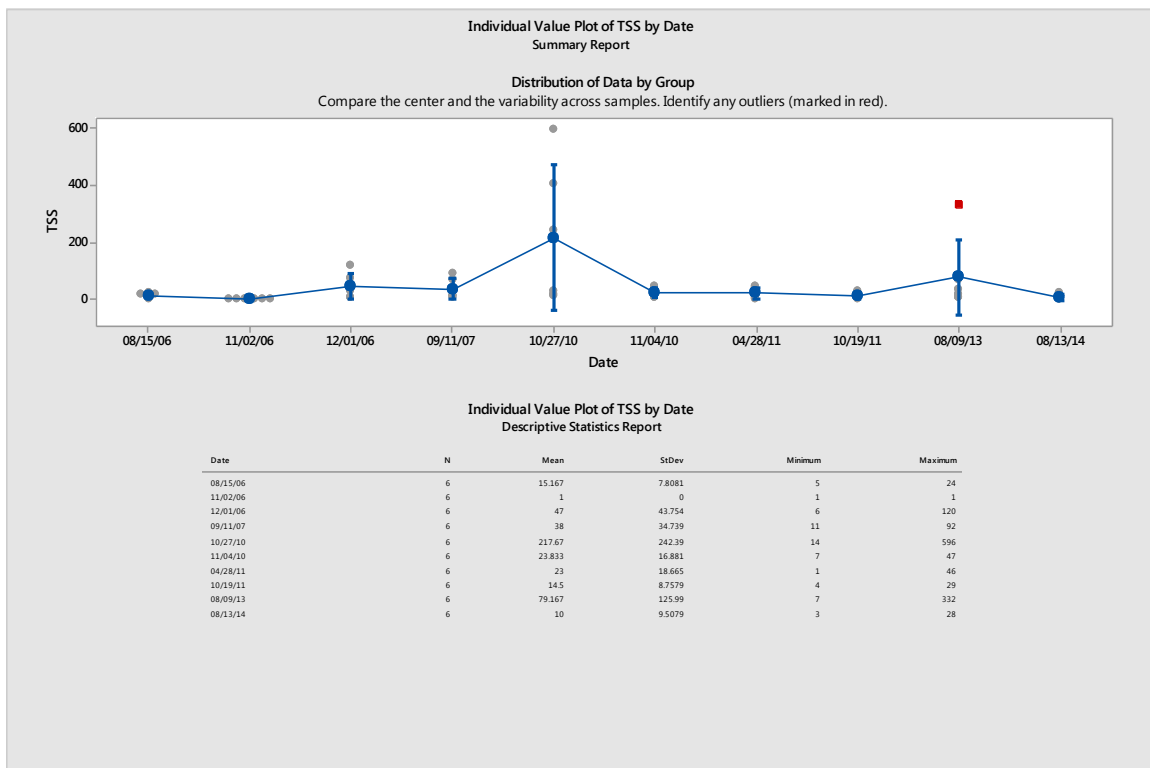


To support recreational uses of surface waters, the CT DEEP Water Quality Standards indicate that the average amount of *E. coli* found in a freshwater water body should be less than 126 CFU/100 mL and that a single sample tested for *E. coli* should be less than 235 CFU/100 mL at a designated swimming area and less than 410 CFU/100 mL in other areas. Monitoring for *E. coli* is currently required in the MS4 permit. Enterococci is another bacteria used to indicate the presence of fecal material in salt water environments. For recreation in salt water the Water Quality Standards indicate that average amount of Enterococci should be less than 35 CFU/100 mL in a designated swimming area and that a single sample tested for Enterococci should be less than 104 CFU/100 mL and in all other areas less than 500 CFU/100 mL. These targets have been included in the statewide bacteria TMDLs. In the Draft MS4 permit, *E.coli* results higher than 235 CFU/100 mL at a designated swimming area or greater than 410 CFU/100 mL in other areas requires a follow-up investigation. Individual stormwater sample results that exceed the applicable single sample maximum value for bacteria could impact water quality, so the associated outfalls should be evaluated for additional stormwater management.

## Total Suspended Solids

Total Suspended Solids (TSS) is a measurement of the amount of solids (including sand and silt) found in the stormwater sample. High concentrations of TSS can lower water quality in the receiving stream by transporting various pollutants to the waterbody where they can directly affect aquatic life or affect aquatic life by absorbing light, reducing photosynthesis, and by making the water warmer. TSS can also clog fish gills and smother fish eggs and suffocate the organisms that fish eat. TSS comes from erosion and is found in agricultural, urban and industrial runoff. TSS can be reduced by protecting land from erosion and allowing stormwater time to settle before discharging to surface waters.

### Results of annual stormwater monitoring under the MS4 general permit for TSS (mg/L) Town of North Branford

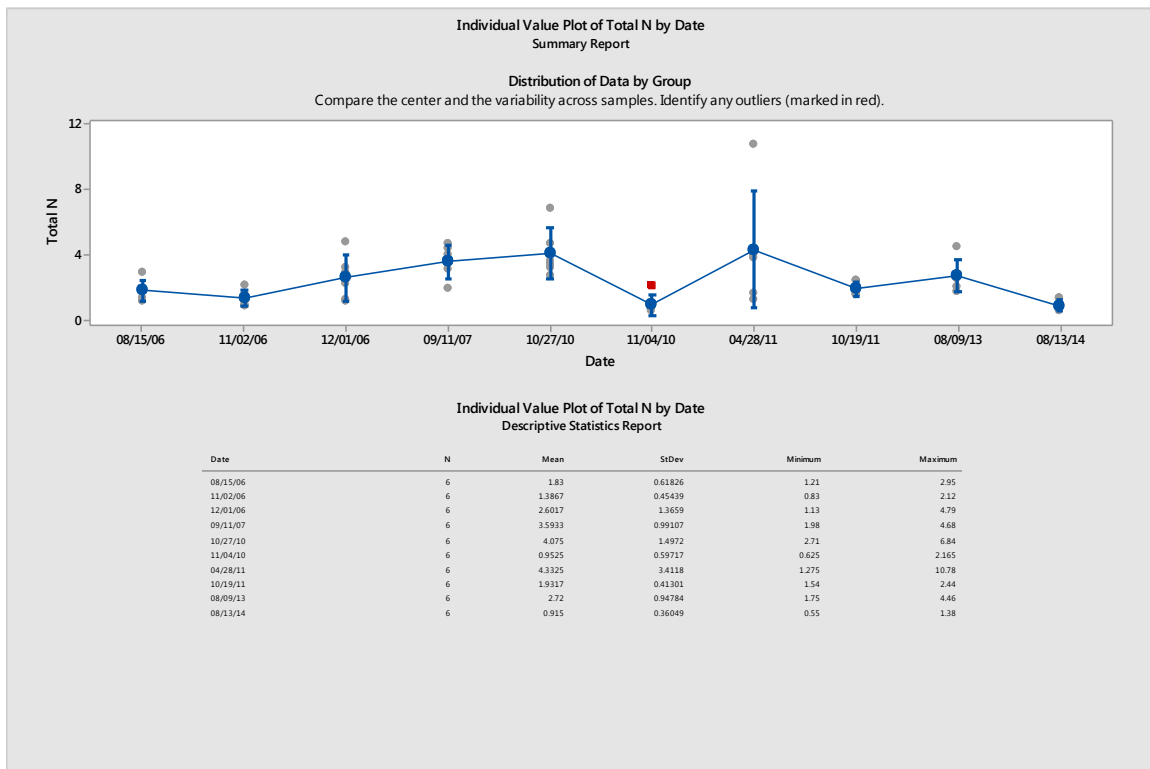


Currently, there is not a water quality based target for TSS in stormwater but TSS is a general indicator of water quality and, lower amounts of TSS are better. For comparison purposes, the average MS4 stormwater result reported for TSS by all towns covered by this permit is 48 mg/L. Areas within your town which have elevated TSS may be places to consider additional stormwater management efforts.

## Total Nitrogen

Nitrogen is an important nutrient in marine and estuarine waters such as Long Island Sound, as well as a concern in fresh water lakes and rivers. High amounts of nitrogen can lead to excessive growth of water plants and algae which then reduces the amount of oxygen available to living things in these waters. Unlawful discharges, animal waste, failing septic systems, leaves, litter and fertilizers are common sources of high nitrogen in stormwater. Responsible use of fertilizers, maintaining septic systems and proper disposal of pet waste will help reduce nitrogen in stormwater.

### Results of annual stormwater monitoring under MS4 general permit for total nitrogen (Total N mg/L) Town of North Branford

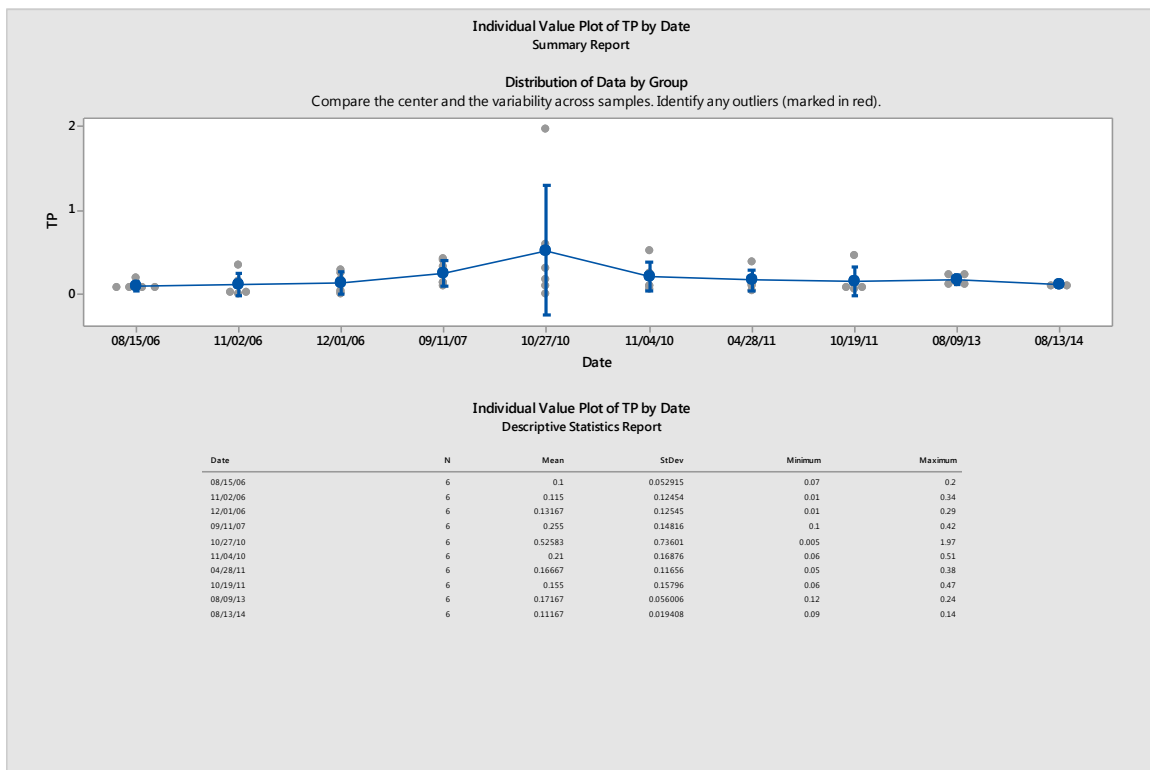


The TMDL for Long Island Sound requires a 10% reduction of nitrogen in stormwater discharges to prevent low oxygen conditions in Long Island Sound. Each town should be working to reduce the amount of nitrogen in their stormwater to address this issue. Under the current draft MS4 permit, any result for total nitrogen greater than 2.5 mg/L will require a follow-up investigation. Areas within your town which have elevated nitrogen may be places to consider additional stormwater management activities.

## Total Phosphorus

Phosphorus is an important nutrient necessary for growth in plants and animals in freshwater. Too much phosphorus in the water can throw off the balance of aquatic ecosystems causing excessive growth of water plants and algae blooms, which reduces the amount of oxygen in the water, potentially harming the fish. Sometimes these algae blooms can contain toxic forms of algae which are harmful to people and animals that come into contact with it. Sources of high phosphorus can be unlawful discharges, fertilizers, litter, leaves, erosion and animal waste.

### Results of annual stormwater monitoring under MS4 permit for total phosphorus (mg/L) Town of North Branford

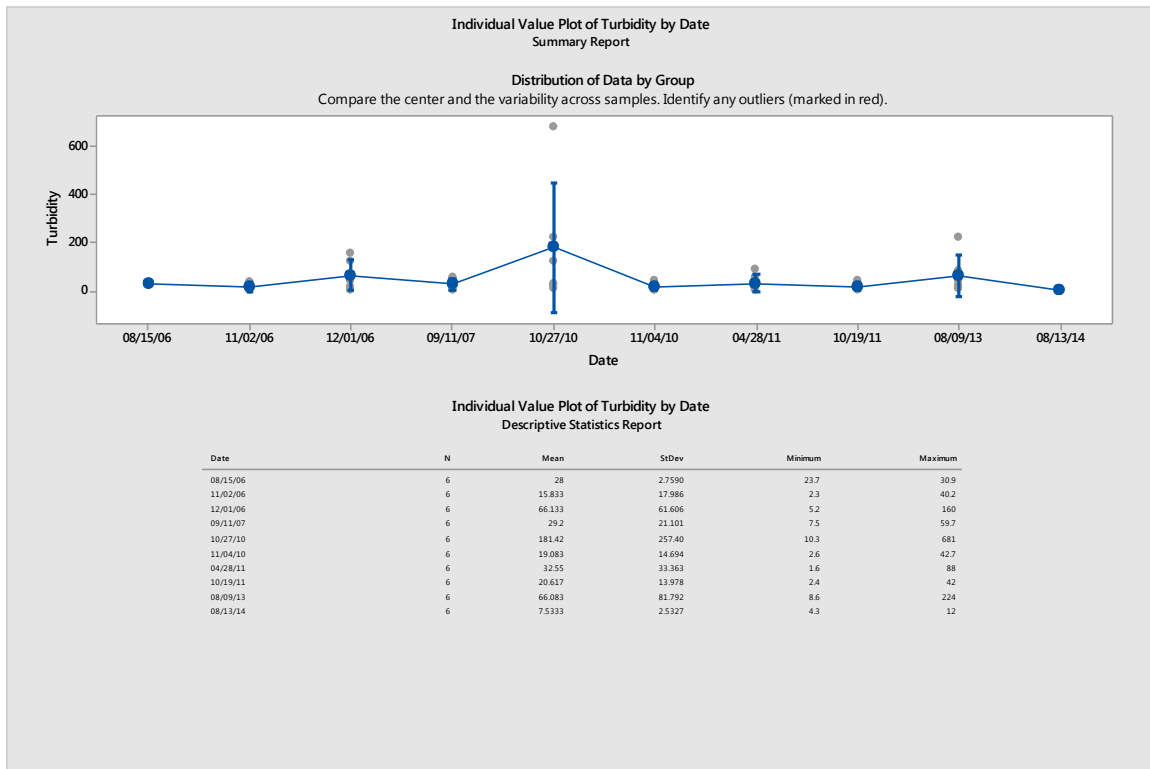


CT DEEP is actively working with many towns to reduce the amount of phosphorus reaching Connecticut's streams and rivers. Under the current draft MS4 permit, a total phosphorus result greater than 0.3 mg/L will require a follow-up investigation. Areas of your town that have elevated levels of phosphorus in the stormwater are good places to develop additional stormwater controls.

## Turbidity

Turbidity measures the clarity of the stormwater sample. It measures how much material (soil, algae, pollution, microbes etc.) is suspended in the sample. High turbidity lowers the water quality of a surface water by blocking sunlight for the plants and makes food harder for the fish to find and may be an indication of a higher amounts of other pollution in the water. Surface waters with high turbidity are visually less appealing for recreational use. High turbidity can be caused by erosion, failing septic systems, decaying plants or animals, and excessive algae growth. Turbidity is reported in Nephelometric Turbidity Units (NTU) which is related to how easily light passes through the water sample.

### Results of annual stormwater monitoring under MS4 permit for turbidity (NTU) Town of North Branford



The Water Quality Standards have a criterion that indicates turbidity should not to exceed 5 NTU above ambient levels. In the draft MS4 permit, a turbidity result greater than 5 NTU over in-stream conditions will require a follow-up investigation. While there is not a fixed statewide criterion for turbidity, lower results are better for the health of the surface waters in town. Areas with higher levels of turbidity in stormwater would be a good place to develop additional stormwater controls.

## Town Maps

The following maps were created to show the impervious cover (IC) in your town as well as the water quality in the rivers, streams, lakes and estuaries in and around your town.

### *Impervious Cover on the Town Maps*

IC is shown in red on the maps. Dark red areas indicate a higher percentage of IC, lighter red areas have less IC, while the grey areas indicate very little or no IC.

### *Water Quality on the Town Maps*

Separate maps are provided for the different uses of the waterbodies such as Aquatic Life Uses, Recreation, and Shellfishing (in coastal towns). The waterbodies are colored to show the health of the waterbody. Green means that the waterbody meets the water quality requirements to fully support the specified use. Yellow means that water quality is poor and that the specified use is not met. Blue means that there is not enough information to know whether or not water quality is good or bad to support the specified use. Additionally, a small map is provided on the left side of each larger map to show which watersheds are within your town.



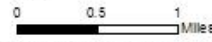
# Waters Designated For Aquatic Life in the Town of North Branford

Percent Impervious Cover	Designated For Aquatic Life
0-11%	Fully Supporting
12-25%	Not Supporting
26-50%	Unassessed
51-75%	
76-100%	

## Subregional Basins

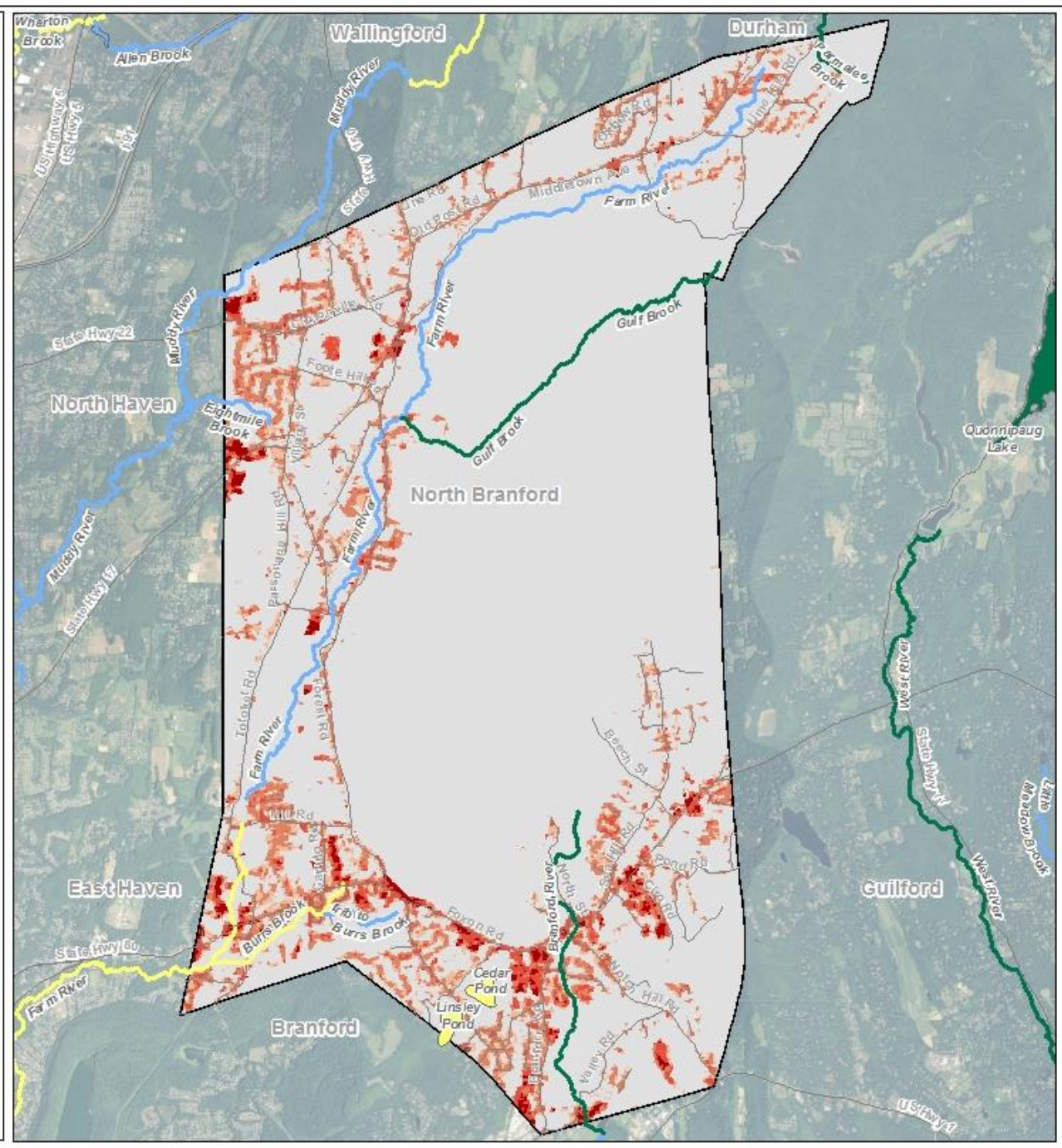


- Branford River
- Coginchaug River
- Farm River
- Muddy River
- West River

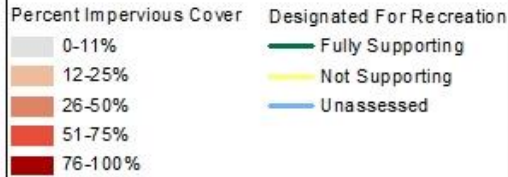


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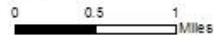
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# Waters Designated For Recreation in the Town of North Branford

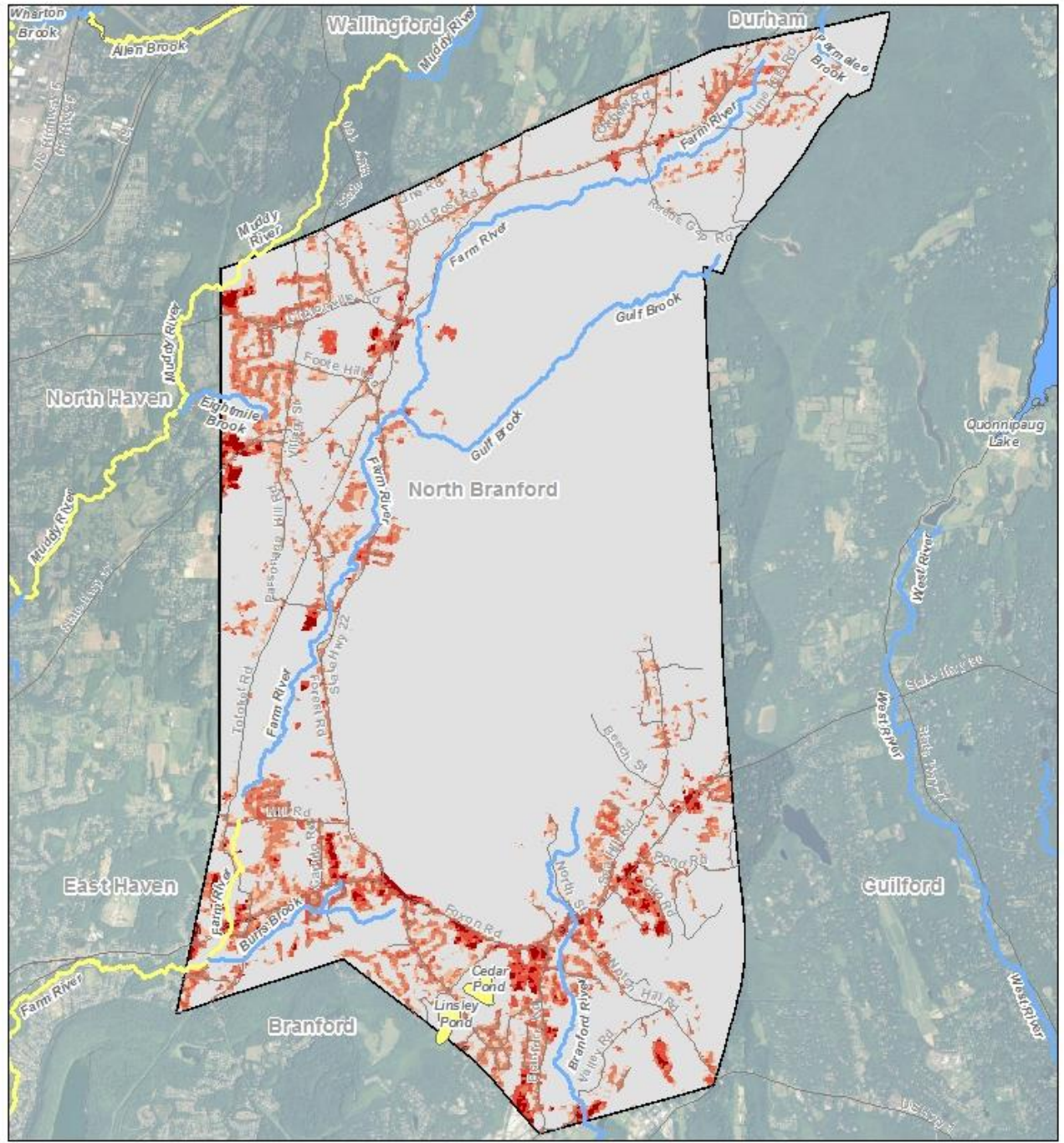


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## **Factsheet: Town of North Haven Water Quality and Stormwater Summary**

This document was created for each town that has submitted monitoring data under the current Small Municipal Separate Storm Sewer System (MS4) General Permit. What follows is information on how stormwater can affect water quality in streams and rivers and a summary of data submitted by your town. This factsheet is intended to help you interpret your monitoring results and assist you in compliance with the MS4 program.

### Water Quality in Connecticut

Surface waters are important resources that support numerous uses, including water supply, recreation, fishing, shellfishing and sustaining aquatic life. Water quality conditions needed to support these uses are identified within the Connecticut Water Quality Standards (WQS). In order to protect and restore these uses, we need acceptable environmental conditions (physical, chemical and biological) to be present within surface waters.

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To find more detailed information on water quality in your town, please see the Integrated Water Quality Report (IWQR) on the CT DEEP website at [www.ct.gov/deep/iwqr](http://www.ct.gov/deep/iwqr). Information on water quality within your town is also presented on the maps included in this fact sheet.

### Impacts of Impervious Cover on Water Quality

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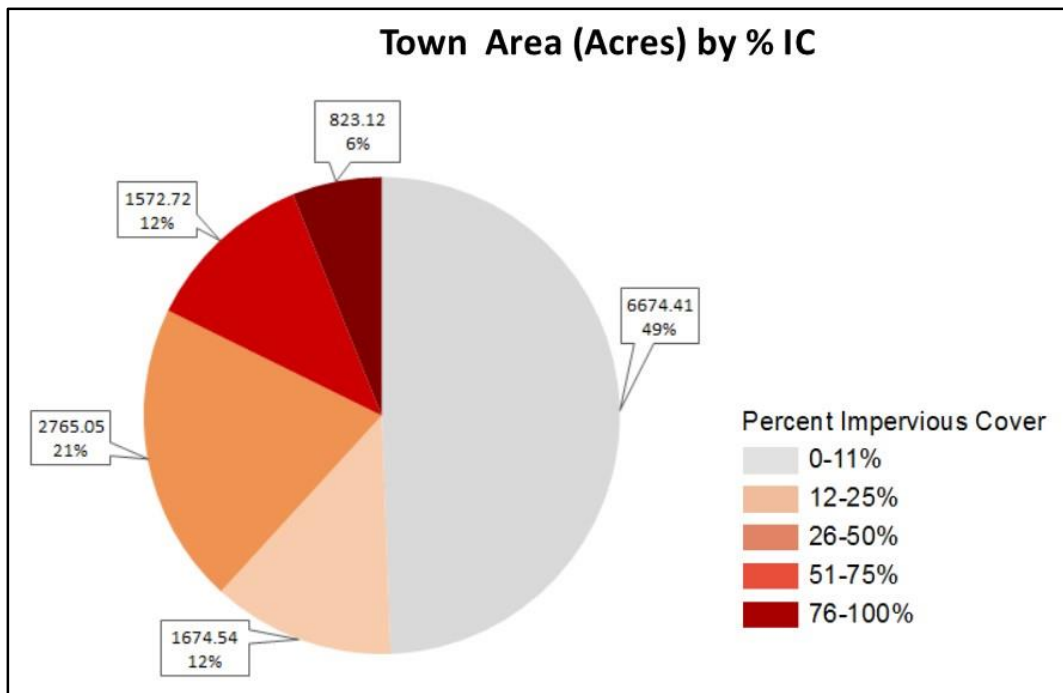
### Town of North Haven: Impervious Cover Data

This chart shows the amount of area within your town that contains IC. Data is grouped by acres and percent IC. While all levels of IC can contribute stormwater to streams, it is important to note that land with IC greater than 12% in town is likely to be contributing enough stormwater to streams to have a negative impact on water quality.

Towns should aim to make stormwater improvements in areas with IC greater than 12% in an effort to reduce the amount of stormwater pollution reaching surface waters which will protect and improve water quality.

For more information on areas of impervious cover within your town, please see the maps at the back of this factsheet.

Amounts of Impervious Cover within the Town of North Haven



### Pollution Reduction

Waterbodies often can handle a certain amount of pollutants and still maintain good water quality. However, impaired waterbodies have too much pollution impacting their water quality and therefore the streams do not support all uses for the waterbody. Total Maximum Daily Loads (TMDLs) are pollution reduction budgets developed for impaired waterbodies in order to meet water quality. If the pollution budget is achieved through the recommended pollution reduction

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TMDLs or Strategies Applicable to the Town of North Haven

<b>Name of TMDL or Strategy</b>	<b>Pollutant</b>	<b>Waterbody Name</b>	<b>Link</b>
Statewide Bacteria TMDL	Bacteria	Mill River / Shepard Brook	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/millriver5302.pdf">www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/millriver5302.pdf</a>
Statewide Bacteria TMDL	Bacteria	Farm River	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/farmriver5112.pdf">www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/farmriver5112.pdf</a>
A TMDL Analysis for Allen Brook Pond, Allen Brook, Gay City Pond, and Schreeder Pond	Bacteria	Allen Brook Pond / Allen Brook	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/allenbrookfinal.pdf">www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/allenbrookfinal.pdf</a>
A TMDL Analysis for the Quinnipiac River Regional Basin	Bacteria	Harbor Brook / Misery Brook / Quinnipiac River / Sodom Brook	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/quinnipiac_tmdl_final.pdf">www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/quinnipiac_tmdl_final.pdf</a>
A TMDL Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound	Nitrogen	Long Island Sound and contributing watersheds	<a href="http://www.ct.gov/deep/lib/deep/water/lis_water_quality/nitrogen_control_program/tmdl.pdf">www.ct.gov/deep/lib/deep/water/lis_water_quality/nitrogen_control_program/tmdl.pdf</a>
Northeast Regional Mercury TMDL	Mercury	All CT Inland waters	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/ne_hg_tmdl.pdf">www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/ne_hg_tmdl.pdf</a>
Interim Phosphorus Reduction Strategy	Phosphorus	Certain CT Inland waters	<a href="http://www.ct.gov/deep/lib/deep/water/water_quality_standards/p/interimmngntphosstrat_042614.pdf">www.ct.gov/deep/lib/deep/water/water_quality_standards/p/interimmngntphosstrat_042614.pdf</a>

For more information on these TMDLs or strategies please go to our website [www.ct.gov/deep/tmdl](http://www.ct.gov/deep/tmdl).

## Stormwater Quality Monitoring

Regular monitoring for targeted pollutants in stormwater provides an indication of potential for water quality impacts and helps identify sources and unlawful discharges. Annual monitoring at 6 locations from different areas of town has been a requirement of the MS4 permit since 2004. CT DEEP uses that information to evaluate the quality of stormwater and the potential for impacts to surface waters as well as to make sure that stormwater is managed properly.

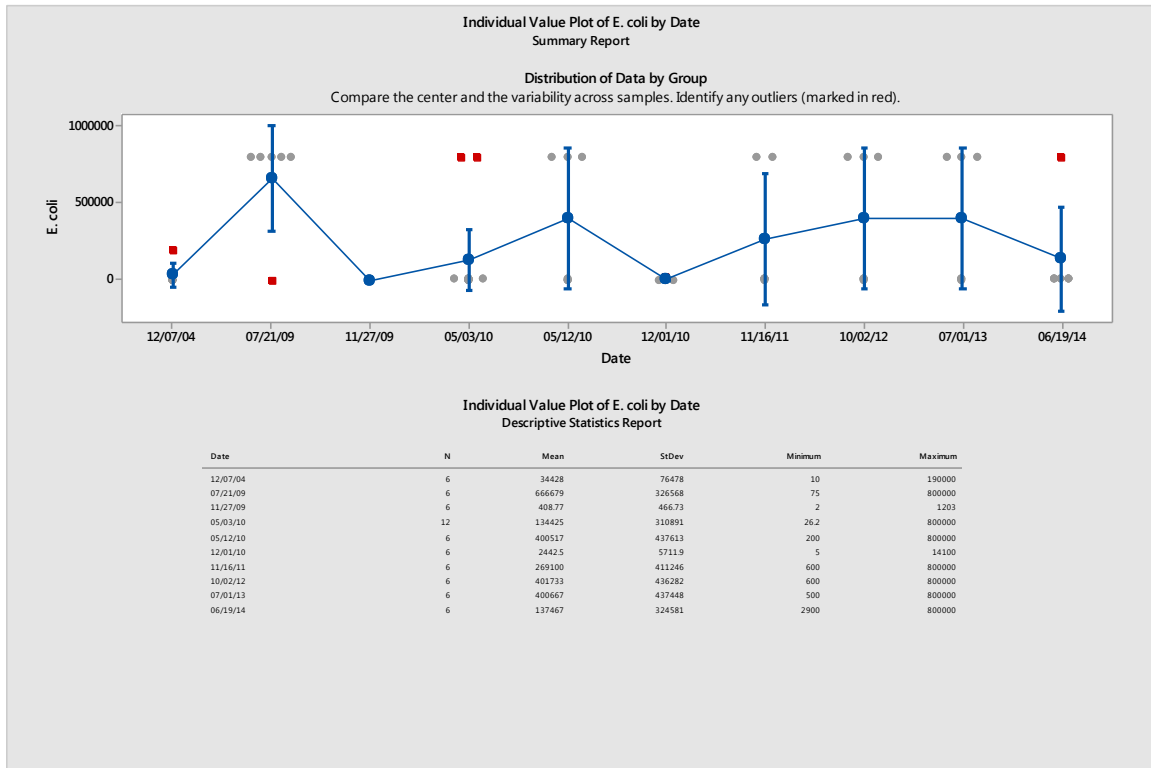
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Mean	Average of the results reported for that sample date
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## Bacteria

*Escherichia coli* (*E. coli*) is a bacteria that lives in the intestines of humans and other warm-blooded animals and is used to indicate the presence of fecal matter in surface waters. Some strains of *E. coli* and other pathogens found in fecal material cause serious illness in people coming in contact with it. For this reason, high amounts of bacteria will cause authorities to close beaches for swimming. Bacteria is measured as the number of colony forming units, or CFU, per 100 ml of water. Any result that was reported as “to numerous to count” is included on the chart as 800,000 CFU/100 mL.

Results of annual stormwater monitoring under MS4 permit for *E.coli* (CFU/ 100 mL of sample)  
Town of North Haven

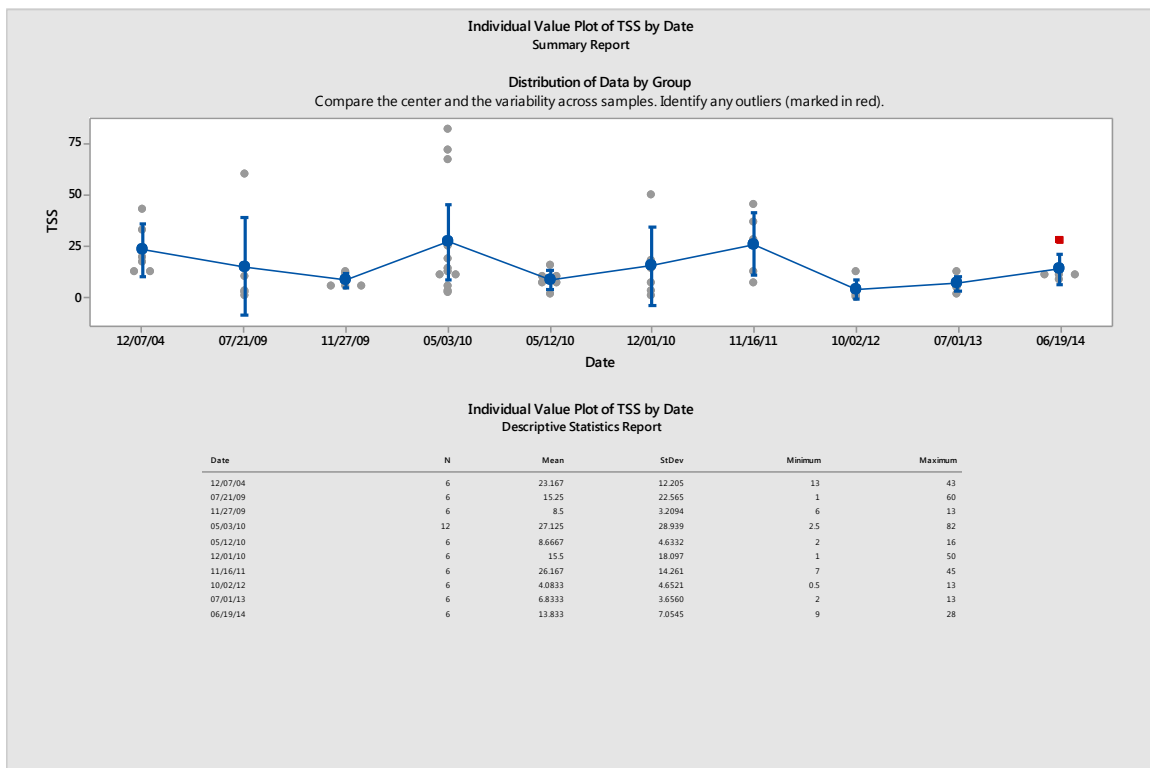


To support recreational uses of surface waters, the CT DEEP Water Quality Standards indicate that the average amount of *E. coli* found in a freshwater water body should be less than 126 CFU/100 mL and that a single sample tested for *E. coli* should be less than 235 CFU/100 mL at a designated swimming area and less than 410 CFU/100 mL in other areas. Monitoring for *E. coli* is currently required in the MS4 permit. Enterococci is another bacteria used to indicate the presence of fecal material in salt water environments. For recreation in salt water the Water Quality Standards indicate that average amount of Enterococci should be less than 35 CFU/100 mL in a designated swimming area and that a single sample tested for Enterococci should be less than 104 CFU/100 mL and in all other areas less than 500 CFU/100 mL. These targets have been included in the statewide bacteria TMDLs. In the Draft MS4 permit, *E.coli* results higher than 235 CFU/100 mL at a designated swimming area or greater than 410 CFU/100 mL in other areas requires a follow-up investigation. Individual stormwater sample results that exceed the applicable single sample maximum value for bacteria could impact water quality, so the associated outfalls should be evaluated for additional stormwater management.

## Total Suspended Solids

Total Suspended Solids (TSS) is a measurement of the amount of solids (including sand and silt) found in the stormwater sample. High concentrations of TSS can lower water quality in the receiving stream by transporting various pollutants to the waterbody where they can directly affect aquatic life or affect aquatic life by absorbing light, reducing photosynthesis, and by making the water warmer. TSS can also clog fish gills and smother fish eggs and suffocate the organisms that fish eat. TSS comes from erosion and is found in agricultural, urban and industrial runoff. TSS can be reduced by protecting land from erosion and allowing stormwater time to settle before discharging to surface waters.

### Results of annual stormwater monitoring under the MS4 general permit for TSS (mg/L) Town of North Haven



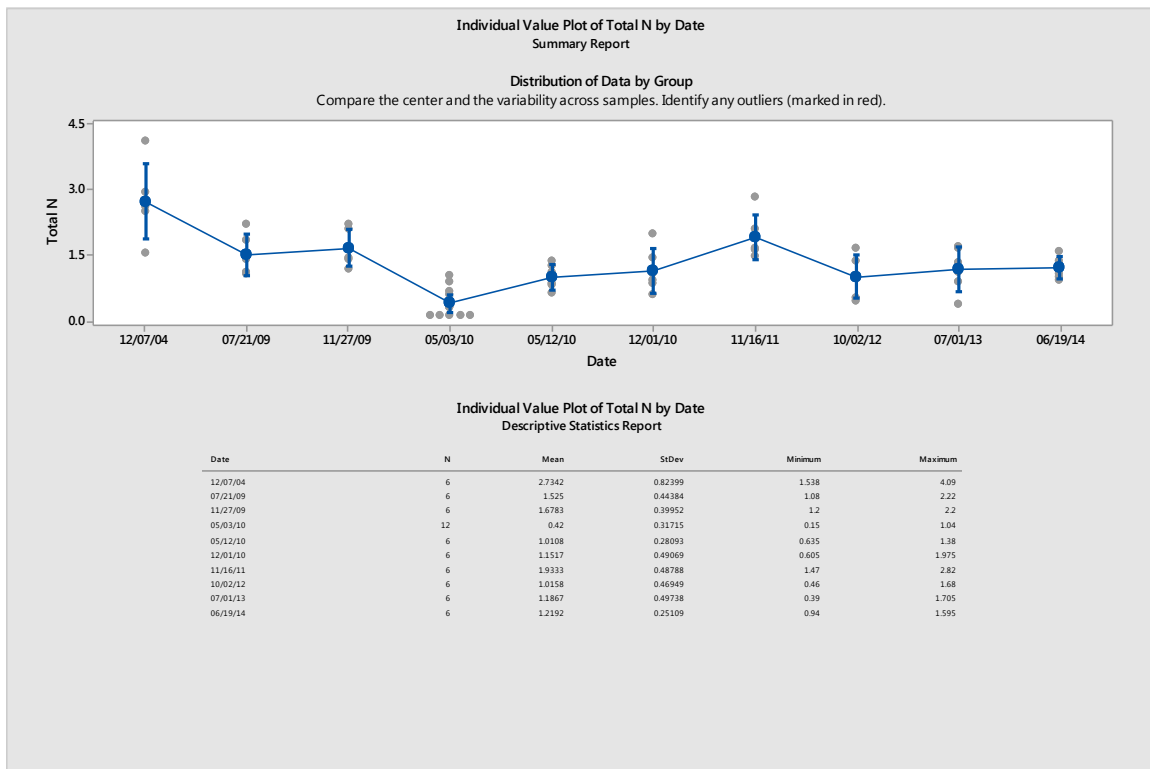
Currently, there is not a water quality based target for TSS in stormwater but TSS is a general indicator of water quality and, lower amounts of TSS are better. For comparison purposes, the average MS4 stormwater result reported for TSS by all towns covered by this permit is 48 mg/L. Areas within your town which have elevated TSS may be places to consider additional stormwater management efforts.



## Total Nitrogen

Nitrogen is an important nutrient in marine and estuarine waters such as Long Island Sound, as well as a concern in fresh water lakes and rivers. High amounts of nitrogen can lead to excessive growth of water plants and algae which then reduces the amount of oxygen available to living things in these waters. Unlawful discharges, animal waste, failing septic systems, leaves, litter and fertilizers are common sources of high nitrogen in stormwater. Responsible use of fertilizers, maintaining septic systems and proper disposal of pet waste will help reduce nitrogen in stormwater.

### Results of annual stormwater monitoring under MS4 general permit for total nitrogen (Total N mg/L) Town of North Haven

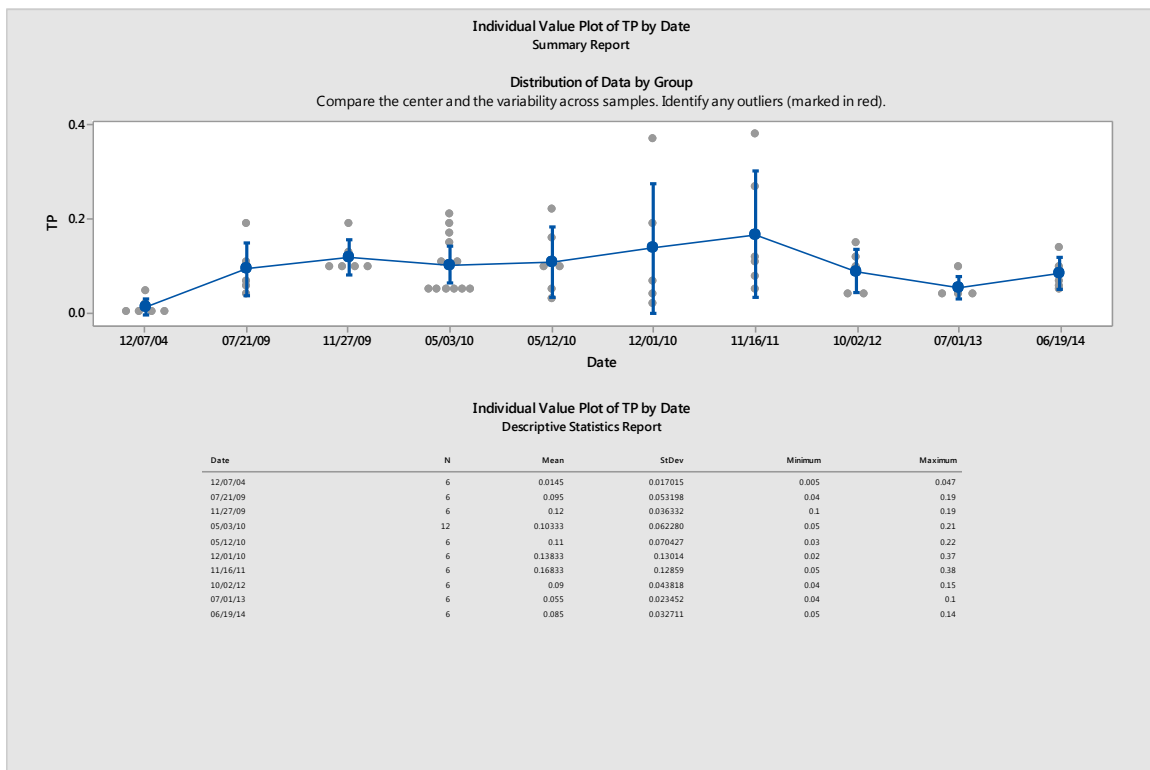


The TMDL for Long Island Sound requires a 10% reduction of nitrogen in stormwater discharges to prevent low oxygen conditions in Long Island Sound. Each town should be working to reduce the amount of nitrogen in their stormwater to address this issue. Under the current draft MS4 permit, any result for total nitrogen greater than 2.5 mg/L will require a follow-up investigation. Areas within your town which have elevated nitrogen may be places to consider additional stormwater management activities.

## Total Phosphorus

Phosphorus is an important nutrient necessary for growth in plants and animals in freshwater. Too much phosphorus in the water can throw off the balance of aquatic ecosystems causing excessive growth of water plants and algae blooms, which reduces the amount of oxygen in the water, potentially harming the fish. Sometimes these algae blooms can contain toxic forms of algae which are harmful to people and animals that come into contact with it. Sources of high phosphorus can be unlawful discharges, fertilizers, litter, leaves, erosion and animal waste.

### Results of annual stormwater monitoring under MS4 permit for total phosphorus (mg/L) Town of North Haven



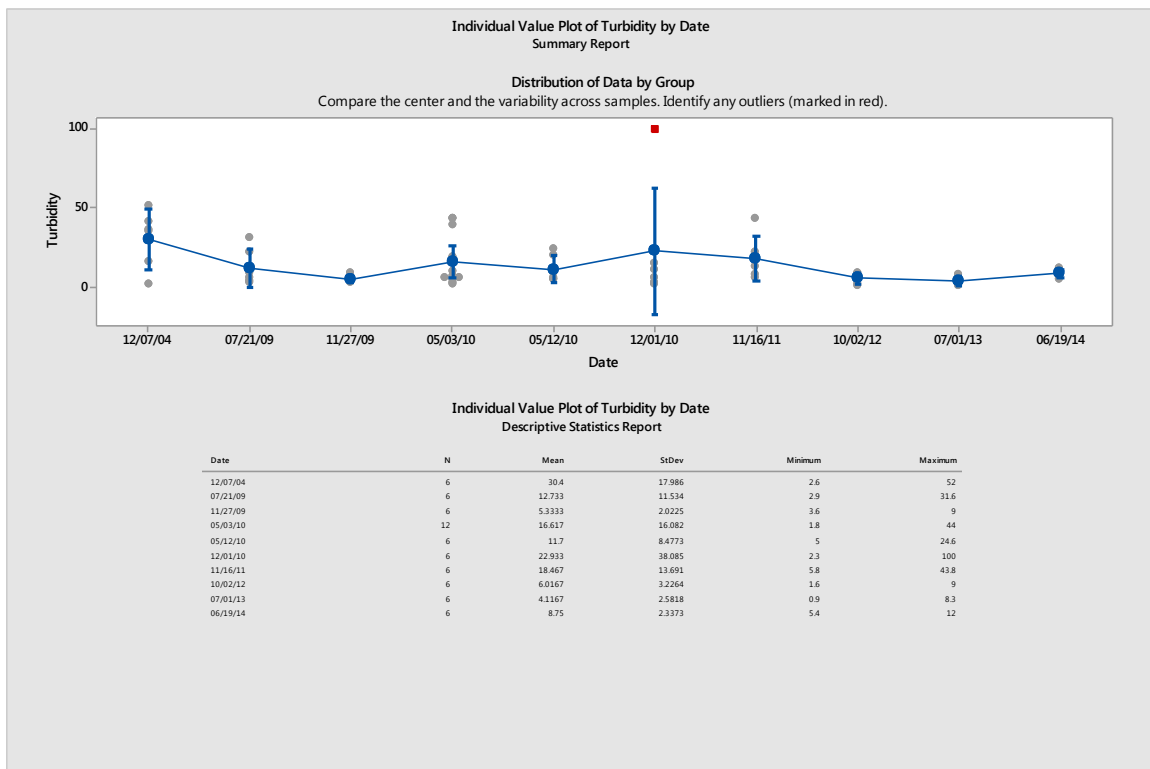
CT DEEP is actively working with many towns to reduce the amount of phosphorus reaching Connecticut's streams and rivers. Under the current draft MS4 permit, a total phosphorus result greater than 0.3 mg/L will require a follow-up investigation. Areas of your town that have elevated levels of phosphorus in the stormwater are good places to develop additional stormwater controls.

## Turbidity

Turbidity measures the clarity of the stormwater sample. It measures how much material (soil, algae, pollution, microbes etc.) is suspended in the sample. High turbidity lowers the water quality of a surface water by blocking sunlight for the plants and makes food harder for the fish to find and may be an indication of a higher amounts of other pollution in the water. Surface waters with high turbidity are visually less appealing for recreational use. High turbidity can be caused by erosion, failing septic systems, decaying plants or animals, and excessive algae growth. Turbidity is reported in Nephelometric Turbidity Units (NTU) which is related to how easily light passes through the water sample.

### Results of annual stormwater monitoring under MS4 permit for turbidity (NTU)

#### Town of North Haven



The Water Quality Standards have a criterion that indicates turbidity should not to exceed 5 NTU above ambient levels. In the draft MS4 permit, a turbidity result greater than 5 NTU over in-stream conditions will require a follow-up investigation. While there is not a fixed statewide criterion for turbidity, lower results are better for the health of the surface waters in town. Areas with higher levels of turbidity in stormwater would be a good place to develop additional stormwater controls.

## Town Maps

The following maps were created to show the impervious cover (IC) in your town as well as the water quality in the rivers, streams, lakes and estuaries in and around your town.

### *Impervious Cover on the Town Maps*

IC is shown in red on the maps. Dark red areas indicate a higher percentage of IC, lighter red areas have less IC, while the grey areas indicate very little or no IC.

### *Water Quality on the Town Maps*

Separate maps are provided for the different uses of the waterbodies such as Aquatic Life Uses, Recreation, and Shellfishing (in coastal towns). The waterbodies are colored to show the health of the waterbody. Green means that the waterbody meets the water quality requirements to fully support the specified use. Yellow means that water quality is poor and that the specified use is not met. Blue means that there is not enough information to know whether or not water quality is good or bad to support the specified use. Additionally, a small map is provided on the left side of each larger map to show which watersheds are within your town.

# Waters Designated For Aquatic Life in the Town of North Haven

Percent Impervious Cover	Designated For Aquatic Life
0-11%	Fully Supporting
12-25%	Not Supporting
26-50%	Unassessed
51-75%	
76-100%	

## Subregional Basins

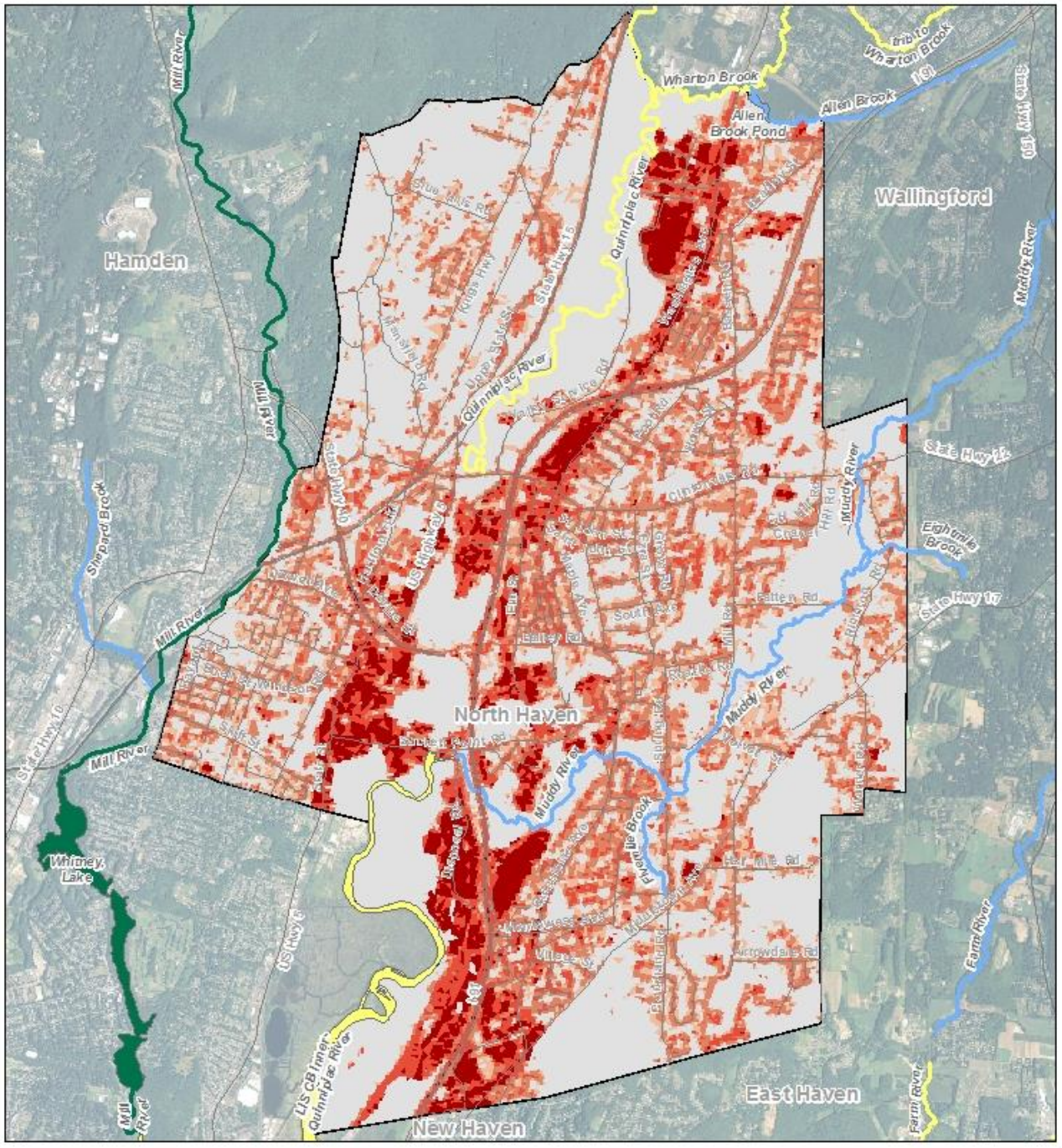


- Farm River
- Mill River
- Muddy River
- Quinnipiac River
- Wharton Brook

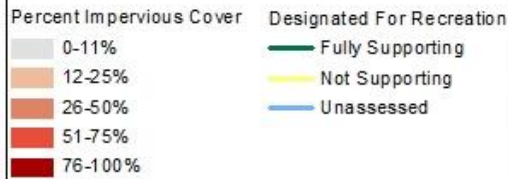


These maps were created using the National Land Cover Database (NLCD) 2011 Impervious Cover Percent Data. For more detail please review the metadata document.

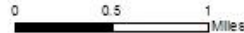
Impervious cover (IC) refers to hard surfaces across the landscape such as pavement or buildings. These hard surfaces do not absorb water and prevent rain from soaking in to the ground. As a result, runoff occurs and easily carries pollutants to nearby lakes and streams.



# Waters Designated For Recreation in the Town of North Haven

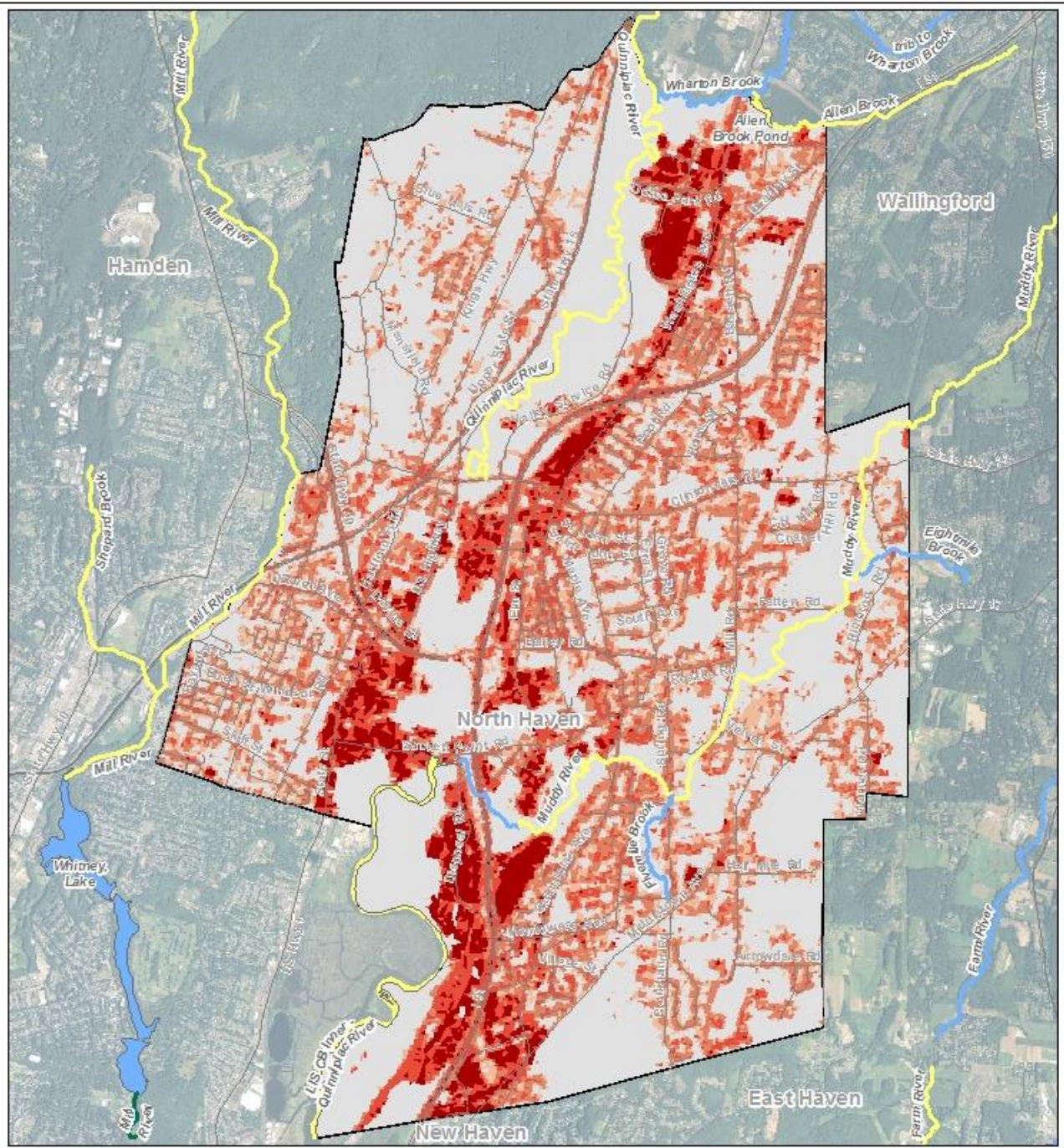


## Subregional Basins



These maps were created using the National Land Cover Database (NLCD) 2011 Impervious Cover Percent Data. For more detail please review the metadata document.

Impervious cover (IC) refers to hard surfaces across the landscape such as pavement or buildings. These hard surfaces do not absorb water and prevent rain from soaking in to the ground. As a result, runoff occurs and easily carries pollutants to nearby lakes and streams.



# Waters Designated For Shellfishing in the Town of North Haven

Percent Impervious Cover	Designated For Shellfishing
0-11%	Fully Supporting
12-25%	Not Supporting
26-50%	Unassessed
51-75%	
76-100%	

## Subregional Basins



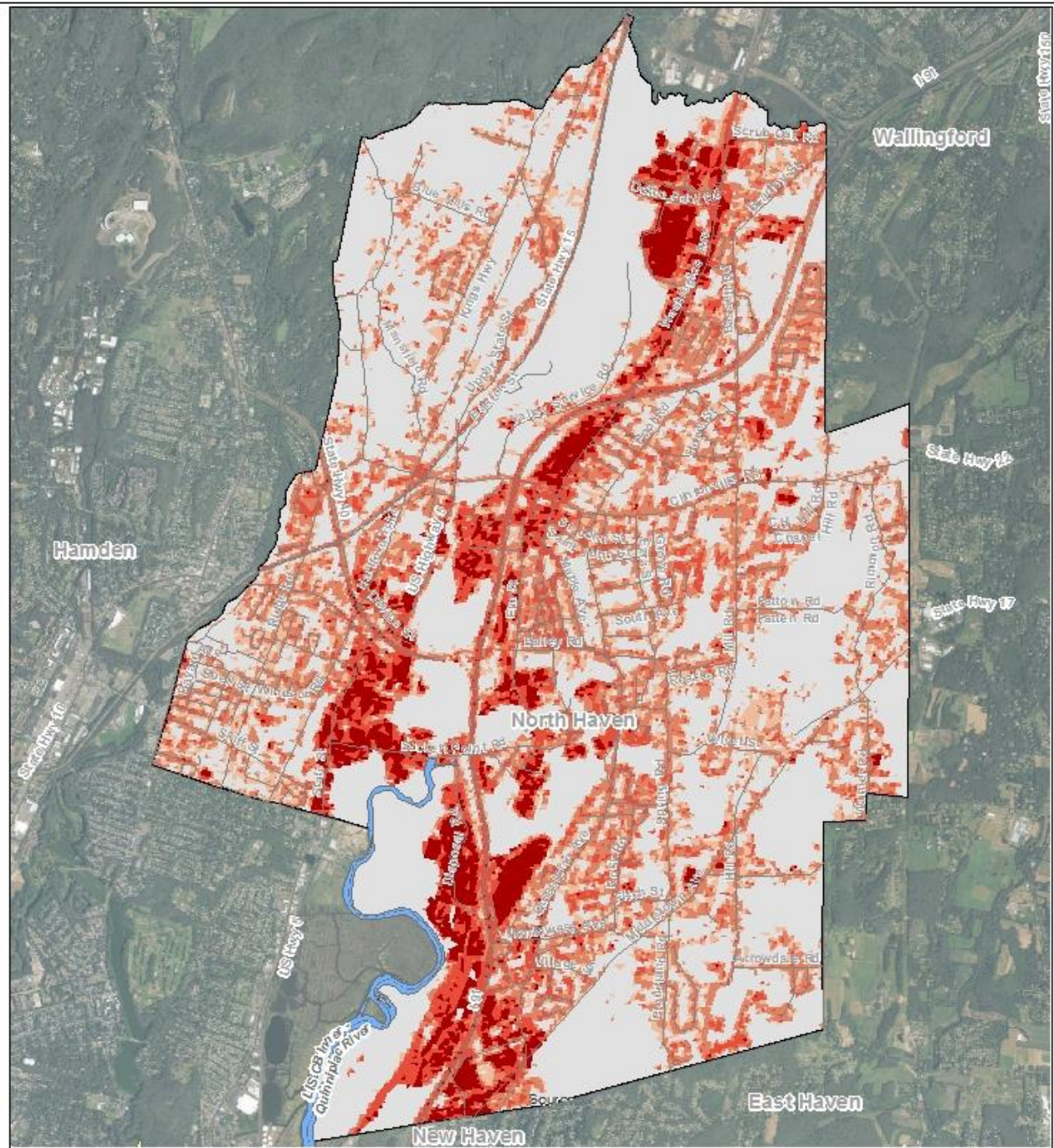
	Farm River		Quinnipiac River
	Mill River		Wharton Brook
	Muddy River		



0 0.5 1 Miles

These maps were created using the National Land Cover Database (NLCD) 2011 Impervious Cover Percent Data. For more detail please review the metadata document.

Impervious cover (IC) refers to hard surfaces across the landscape such as pavement or buildings. These hard surfaces do not absorb water and prevent rain from soaking in to the ground. As a result, runoff occurs and easily carries pollutants to nearby lakes and streams.



## **Factsheet: City of Norwalk Water Quality and Stormwater Summary**

This document was created for each town that has submitted monitoring data under the current Small Municipal Separate Storm Sewer System (MS4) General Permit. What follows is information on how stormwater can affect water quality in streams and rivers and a summary of data submitted by your town. This factsheet is intended to help you interpret your monitoring results and assist you in compliance with the MS4 program.

### Water Quality in Connecticut

Surface waters are important resources that support numerous uses, including water supply, recreation, fishing, shellfishing and sustaining aquatic life. Water quality conditions needed to support these uses are identified within the Connecticut Water Quality Standards (WQS). In order to protect and restore these uses, we need acceptable environmental conditions (physical, chemical and biological) to be present within surface waters.

To assess and track water quality conditions, CT DEEP conducts monitoring across the State. The data is synthesized into a biennial state water quality report called the Integrated Water Quality Report. Currently, specific water quality monitoring in the state encompasses about 50% of rivers, 47% of lakes, and 100% of estuary/coastline. In addition, CT DEEP may have information about certain land uses or discharges which could indicate a potential for water quality to be impacted, even if the waterbody has not been fully monitored and assessed.

To find more detailed information on water quality in your town, please see the Integrated Water Quality Report (IWQR) on the CT DEEP website at [www.ct.gov/deep/iwqr](http://www.ct.gov/deep/iwqr). Information on water quality within your town is also presented on the maps included in this fact sheet.

### Impacts of Impervious Cover on Water Quality

Impervious cover (IC) refers to hard surfaces across the landscape such as roads, sidewalks, parking lots and roofs. Studies have focused on the amount of hard surfaces to evaluate the impacts of stormwater runoff from these hard surfaces on water quality and found that IC affects both the quantity and quality of stormwater. IC forces rain to runoff the land, carrying pollutants quickly and directly to lakes and streams instead of soaking into the ground and being filtered by the soil. For more information on impervious cover, please see the CT DEEP web page [www.ct.gov/deep/imperviouscoverstudies](http://www.ct.gov/deep/imperviouscoverstudies) and EPA's web page [www.epa.gov/caddis/ssr\\_urb\\_isl.html](http://www.epa.gov/caddis/ssr_urb_isl.html).

In general, the higher the percentage of IC in a watershed, the poorer the surface water quality. Research in Connecticut strongly suggests that aquatic life will be harmed when the IC within a



watershed exceeds 12%. Stormwater pollution from IC is a likely cause of impairment for these waterbodies.

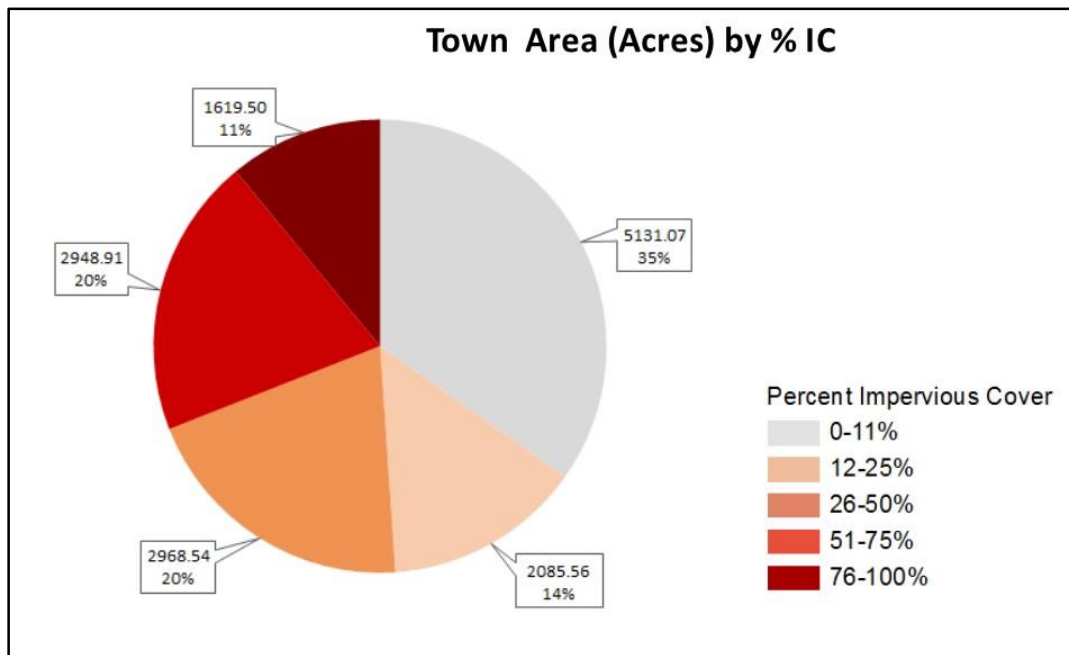
### City of Norwalk: Impervious Cover Data

This chart shows the amount of area within your town that contains IC. Data is grouped by acres and percent IC. While all levels of IC can contribute stormwater to streams, it is important to note that land with IC greater than 12% in town is likely to be contributing enough stormwater to streams to have a negative impact on water quality.

Towns should aim to make stormwater improvements in areas with IC greater than 12% in an effort to reduce the amount of stormwater pollution reaching surface waters which will protect and improve water quality.

For more information on areas of impervious cover within your town, please see the maps at the back of this factsheet.

Amounts of Impervious Cover within the City of Norwalk



### Pollution Reduction

Waterbodies often can handle a certain amount of pollutants and still maintain good water quality. However, impaired waterbodies have too much pollution impacting their water quality and therefore the streams do not support all uses for the waterbody. Total Maximum Daily Loads (TMDLs) are pollution reduction budgets developed for impaired waterbodies in order to meet water quality. If the pollution budget is achieved through the recommended pollution reduction measures, then the waterbody is expected to meet water quality. CT DEEP also supports

impaired waters restoration through watershed based plans ([www.ct.gov/deep/watershed](http://www.ct.gov/deep/watershed)) which provide more specific non-point source pollution control measures. The following TMDLs or pollution reduction strategies have been developed and apply to areas within your town.

TMDLs or Strategies Applicable to the City of Norwalk

<b>Name of TMDL or Strategy</b>	<b>Pollutant</b>	<b>Waterbody Name</b>	<b>Link</b>
Statewide Bacteria TMDL	Bacteria	Southwest Shoreline / Indian River	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/southwestshoreline7000.pdf">www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/southwestshoreline7000.pdf</a>
Statewide Bacteria TMDL	Bacteria	Silvermine River	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/silvermineriver7302.pdf">www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/silvermineriver7302.pdf</a>
Statewide Bacteria TMDL	Bacteria	Five Mile River / Keelers Brook / Holy Ghost Father's Brook	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/fivemileriver7401.pdf">http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/fivemileriver7401.pdf</a>
Statewide Bacteria TMDL	Bacteria	Saugatuck River / Beaver Brook / Kettle Creek / Poplar Plain Brook	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/saugatuck7200.pdf">www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/saugatuck7200.pdf</a>
Statewide Bacteria TMDL	Bacteria	Estuary 3: Darien	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/estuary3darien.pdf">www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/estuary3darien.pdf</a>
A TMDL Analysis for the Norwalk River Regional Basin	Bacteria	Norwalk River / Ridgefield Brook / Silvermine River	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/norwalktmdlfinal.pdf">www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/norwalktmdlfinal.pdf</a>
Statewide Bacteria TMDL	Bacteria	Estuary 1: Norwalk	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/estuary1norwalk.pdf">www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/estuary1norwalk.pdf</a>
Statewide Bacteria TMDL	Bacteria	West Branch Saugatuck River / Cobbs Mill	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/westbranchsaugatuckriver7203.pdf">www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/westbranchsaugatuckriver7203.pdf</a>
A TMDL Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound	Nitrogen	Long Island Sound and contributing watersheds	<a href="http://www.ct.gov/deep/lib/deep/water/lis_water_quality/nitrogen_control_program/tmdl.pdf">www.ct.gov/deep/lib/deep/water/lis_water_quality/nitrogen_control_program/tmdl.pdf</a>
Northeast Regional Mercury TMDL	Mercury	All CT Inland waters	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/ne_hg_tmdl.pdf">www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/ne_hg_tmdl.pdf</a>
Interim Phosphorus Reduction Strategy	Phosphorus	Certain CT Inland waters	<a href="http://www.ct.gov/deep/lib/deep/water/water_quality_standards/p/interimmgntphosstrat_042614.pdf">www.ct.gov/deep/lib/deep/water/water_quality_standards/p/interimmgntphosstrat_042614.pdf</a>

For more information on these TMDLs or strategies please go to our website [www.ct.gov/deep/tmdl](http://www.ct.gov/deep/tmdl).

### Stormwater Quality Monitoring

Regular monitoring for targeted pollutants in stormwater provides an indication of potential for water quality impacts and helps identify sources and unlawful discharges. Annual monitoring at 6 locations from different areas of town has been a requirement of the MS4 permit since 2004. CT DEEP uses that information to evaluate the quality of stormwater and the potential for impacts to surface waters as well as to make sure that stormwater is managed properly.

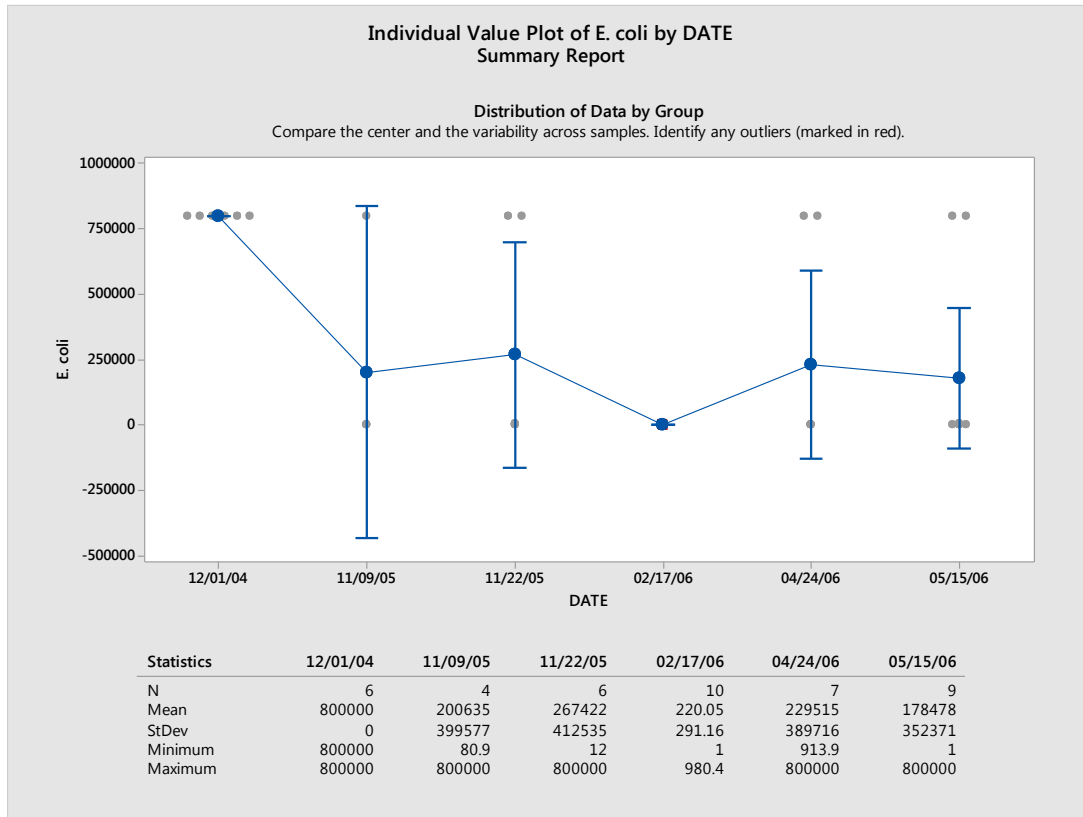
Below are 5 graphs tracking stormwater results submitted by your town for 5 parameters reported under the current MS4 General Permit. The results of each stormwater test submitted to CT DEEP by your town is shown. Individual sample results are shown in grey while the average of the samples collected on a particular day is shown in blue, with a line connecting the averages for the various sample dates. The bars show the statistical range of samples for each day with the red squares showing results which are considered to be outliers, that is, very different from the other samples collected on that day. The chart on the graph lists the sample dates and some basic statistics:

<b>Statistic</b>	<b>Description</b>
N	Number of stormwater samples collected on that date
Mean	Average of the results reported for that sample date
Standard Deviation (StdDev)	A measure of the variability of the results for the sample date
Minimum	The lowest sample result for the sample date
Maximum	The highest sample result for the sample date

### Bacteria

*Escherichia coli* (*E. coli*) is a bacteria that lives in the intestines of humans and other warm-blooded animals and is used to indicate the presence of fecal matter in surface waters. Some strains of *E. coli* and other pathogens found in fecal material cause serious illness in people coming in contact with it. For this reason, high amounts of bacteria will cause authorities to close beaches for swimming. Bacteria is measured as the number of colony forming units, or CFU, per 100 ml of water. Any result that was reported as “to numerous to count” is included on the chart as 800,000 CFU/100 mL.

Results of annual stormwater monitoring under MS4 permit for *E.coli* (CFU/ 100 mL of sample)  
City of Norwalk

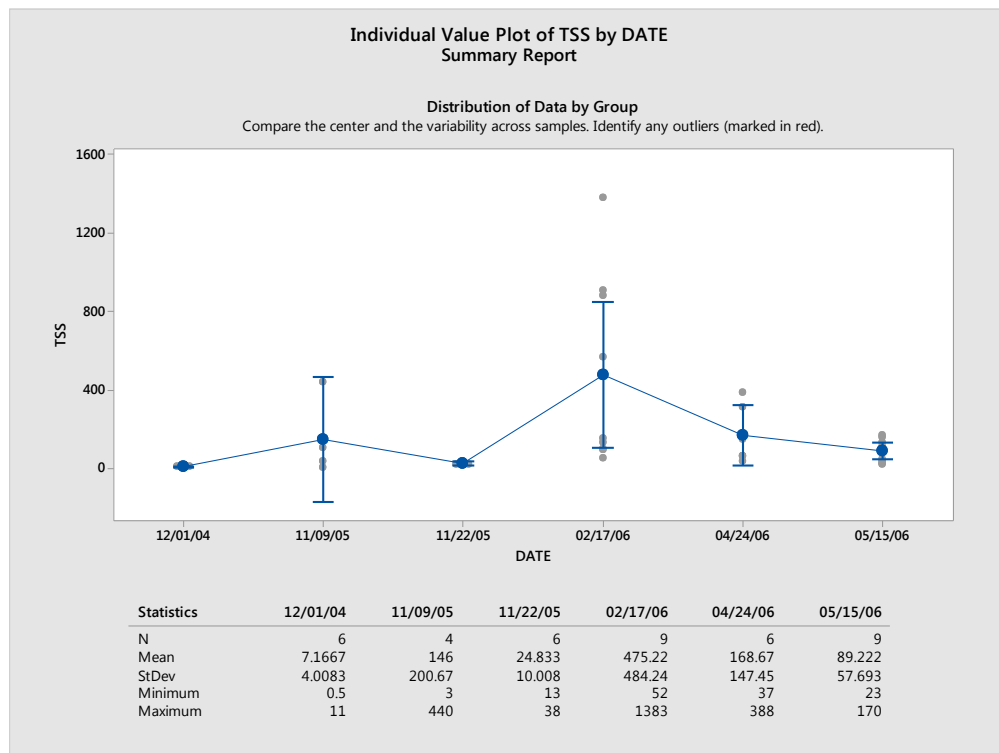


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## Total Suspended Solids

Total Suspended Solids (TSS) is a measurement of the amount of solids (including sand and silt) found in the stormwater sample. High concentrations of TSS can lower water quality in the receiving stream by transporting various pollutants to the waterbody where they can directly affect aquatic life or affect aquatic life by absorbing light, reducing photosynthesis, and by making the water warmer. TSS can also clog fish gills and smother fish eggs and suffocate the organisms that fish eat. TSS comes from erosion and is found in agricultural, urban and industrial runoff. TSS can be reduced by protecting land from erosion and allowing stormwater time to settle before discharging to surface waters.

### Results of annual stormwater monitoring under the MS4 general permit for TSS (mg/L) City of Norwalk

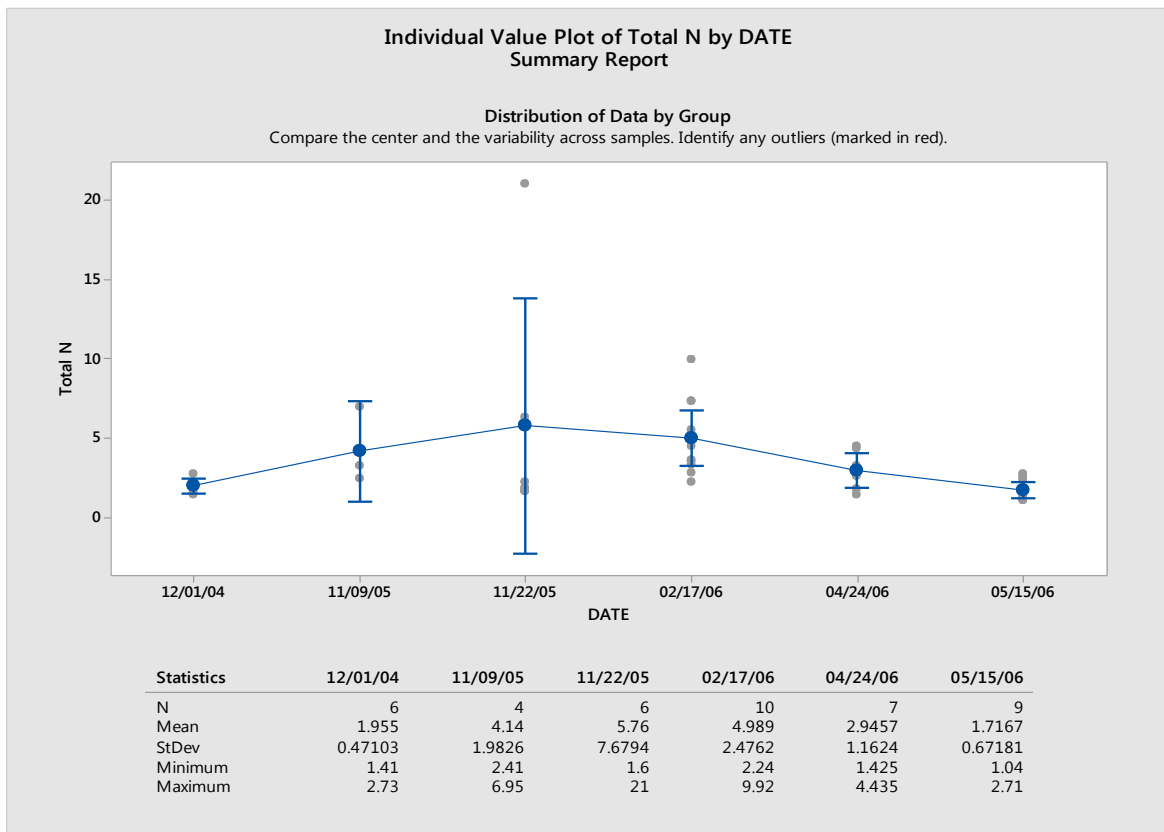


Currently, there is not a water quality based target for TSS in stormwater but TSS is a general indicator of water quality and, lower amounts of TSS are better. For comparison purposes, the average MS4 stormwater result reported for TSS by all towns covered by this permit is 48 mg/L. Areas within your town which have elevated TSS may be places to consider additional stormwater management efforts.

## Total Nitrogen

Nitrogen is an important nutrient in marine and estuarine waters such as Long Island Sound, as well as a concern in fresh water lakes and rivers. High amounts of nitrogen can lead to excessive growth of water plants and algae which then reduces the amount of oxygen available to living things in these waters. Unlawful discharges, animal waste, failing septic systems, leaves, litter and fertilizers are common sources of high nitrogen in stormwater. Responsible use of fertilizers, maintaining septic systems and proper disposal of pet waste will help reduce nitrogen in stormwater.

### Results of annual stormwater monitoring under MS4 general permit for total nitrogen (Total N mg/L) City of Norwalk

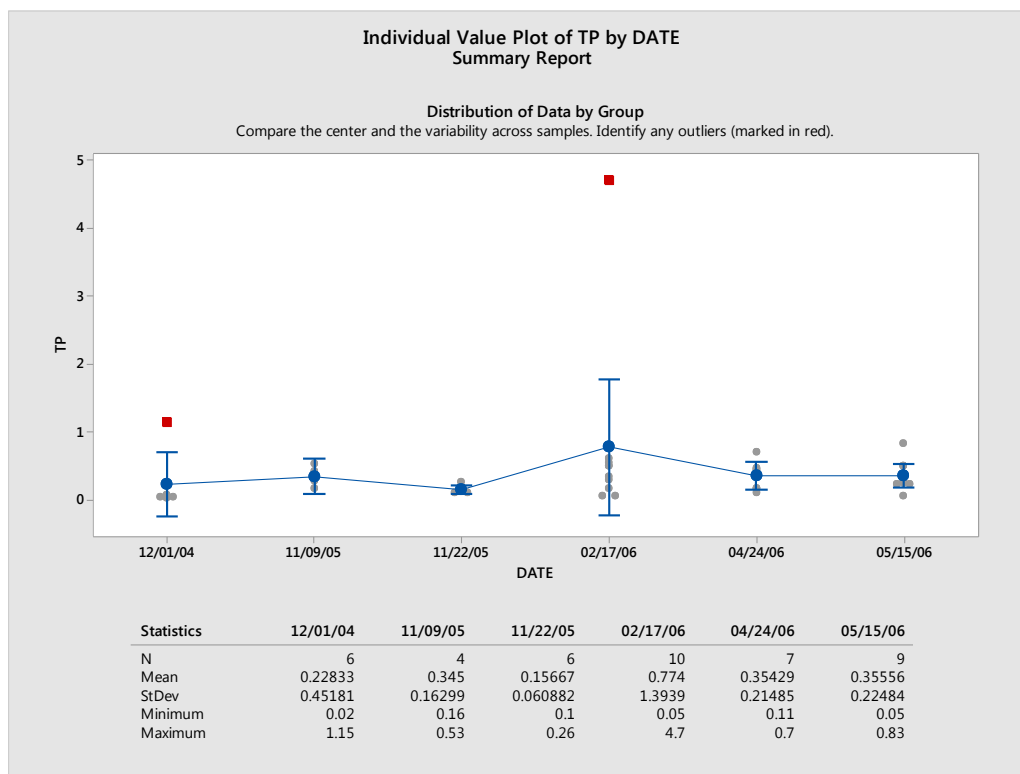


The TMDL for Long Island Sound requires a 10% reduction of nitrogen in stormwater discharges to prevent low oxygen conditions in Long Island Sound. Each town should be working to reduce the amount of nitrogen in their stormwater to address this issue. Under the current draft MS4 permit, any result for total nitrogen greater than 2.5 mg/L will require a follow-up investigation. Areas within your town which have elevated nitrogen may be places to consider additional stormwater management activities.

## Total Phosphorus

Phosphorus is an important nutrient necessary for growth in plants and animals in freshwater. Too much phosphorus in the water can throw off the balance of aquatic ecosystems causing excessive growth of water plants and algae blooms, which reduces the amount of oxygen in the water, potentially harming the fish. Sometimes these algae blooms can contain toxic forms of algae which are harmful to people and animals that come into contact with it. Sources of high phosphorus can be unlawful discharges, fertilizers, litter, leaves, erosion and animal waste.

### Results of annual stormwater monitoring under MS4 permit for total phosphorus (mg/L) City of Norwalk

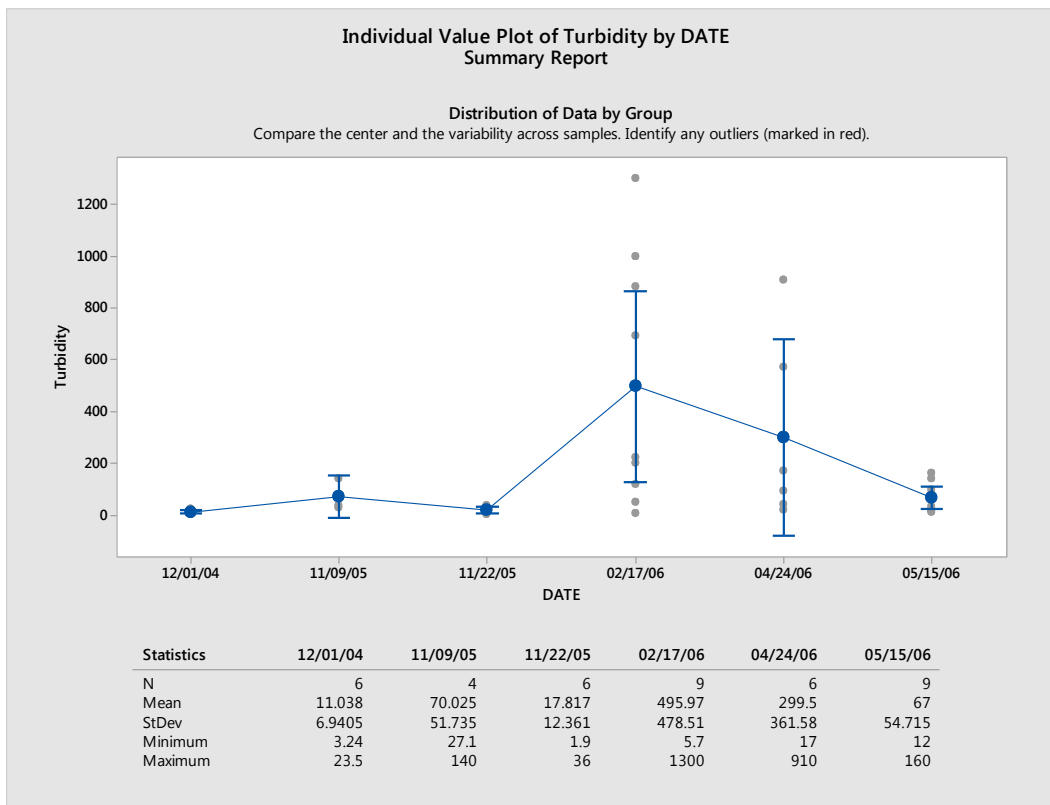


CT DEEP is actively working with many towns to reduce the amount of phosphorus reaching Connecticut's streams and rivers. Under the current draft MS4 permit, a total phosphorus result greater than 0.3 mg/L will require a follow-up investigation. Areas of your town that have elevated levels of phosphorus in the stormwater are good places to develop additional stormwater controls.

## Turbidity

Turbidity measures the clarity of the stormwater sample. It measures how much material (soil, algae, pollution, microbes etc.) is suspended in the sample. High turbidity lowers the water quality of a surface water by blocking sunlight for the plants and makes food harder for the fish to find and may be an indication of a higher amounts of other pollution in the water. Surface waters with high turbidity are visually less appealing for recreational use. High turbidity can be caused by erosion, failing septic systems, decaying plants or animals, and excessive algae growth. Turbidity is reported in Nephelometric Turbidity Units (NTU) which is related to how easily light passes through the water sample.

### Results of annual stormwater monitoring under MS4 permit for turbidity (NTU) City of Norwalk



The Water Quality Standards have a criterion that indicates turbidity should not to exceed 5 NTU above ambient levels. In the draft MS4 permit, a turbidity result greater than 5 NTU over in-stream conditions will require a follow-up investigation. While there is not a fixed statewide criterion for turbidity, lower results are better for the health of the surface waters in town. Areas with higher levels of turbidity in stormwater would be a good place to develop additional stormwater controls.



## Town Maps

The following maps were created to show the impervious cover (IC) in your town as well as the water quality in the rivers, streams, lakes and estuaries in and around your town.

### *Impervious Cover on the Town Maps*

IC is shown in red on the maps. Dark red areas indicate a higher percentage of IC, lighter red areas have less IC, while the grey areas indicate very little or no IC.

### *Water Quality on the Town Maps*

Separate maps are provided for the different uses of the waterbodies such as Aquatic Life Uses, Recreation, and Shellfishing (in coastal towns). The waterbodies are colored to show the health of the waterbody. Green means that the waterbody meets the water quality requirements to fully support the specified use. Yellow means that water quality is poor and that the specified use is not met. Blue means that there is not enough information to know whether or not water quality is good or bad to support the specified use. Additionally, a small map is provided on the left side of each larger map to show which watersheds are within your town.

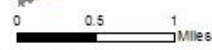
# Waters Designated For Aquatic Life in the Town of Norwalk

Percent Impervious Cover	Designated For Aquatic Life
0-11%	Fully Supporting
12-25%	Not Supporting
26-50%	Unassessed
51-75%	
76-100%	

## Subregional Basins

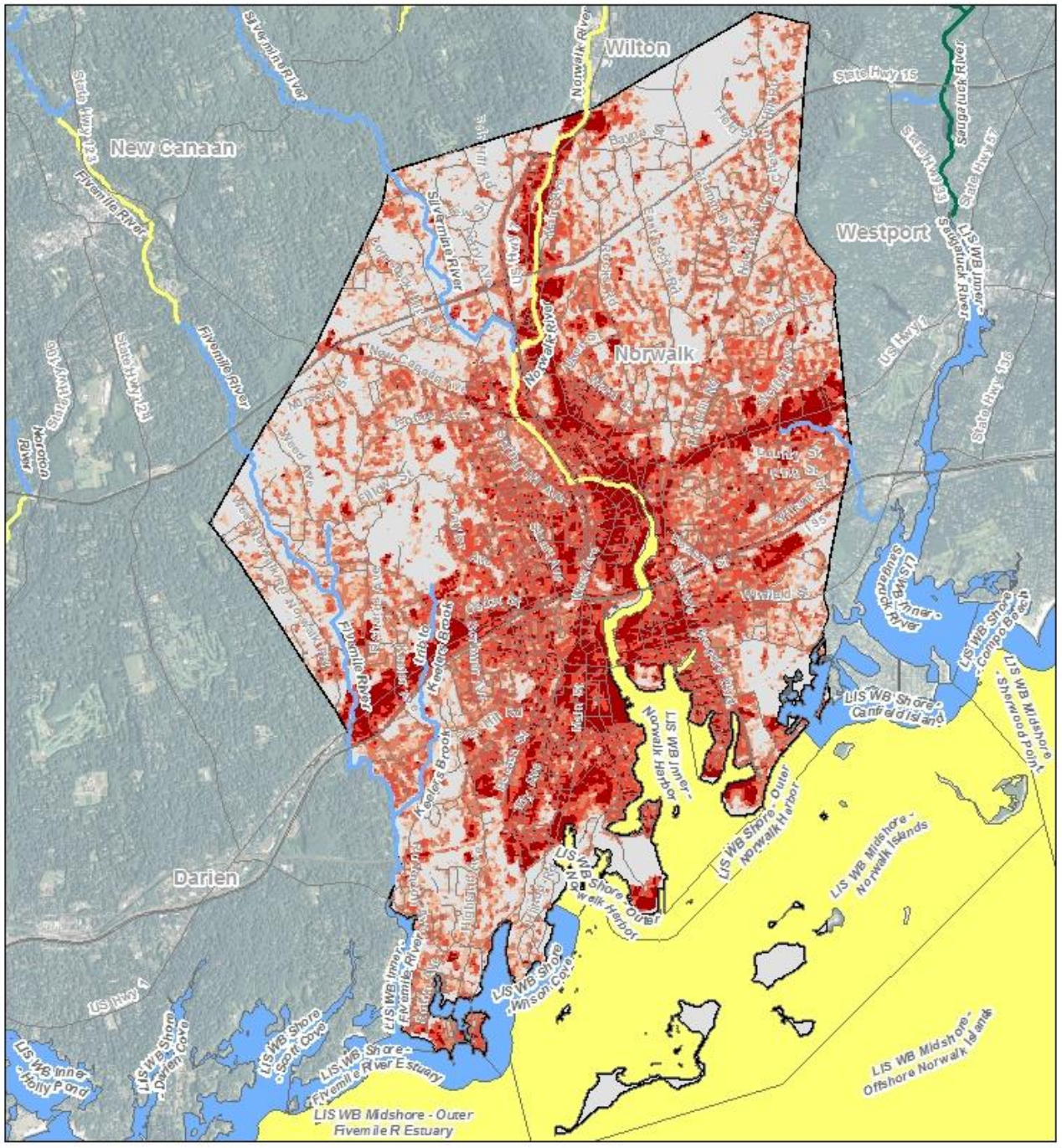


Darien River	Silvermine River
Fivemile River	Southwest Shoreline
Norwalk River	West Branch Saugatuck River
Saugatuck River	



These maps were created using the National Land Cover Database (NLCD) 2011 Impervious Cover Percent Data. For more detail please review the metadata document.

Impervious cover (IC) refers to hard surfaces across the landscape such as pavement or buildings. These hard surfaces do not absorb water and prevent rain from soaking in to the ground. As a result, runoff occurs and easily carries pollutants to nearby lakes and streams.



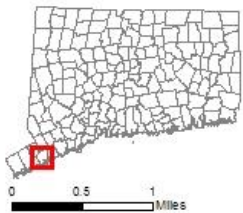
# Waters Designated For Recreation in the Town of Norwalk

Percent Impervious Cover	Designated For Recreation
0-11%	Fully Supporting
12-25%	Not Supporting
26-50%	Unassessed
51-75%	
76-100%	

## Subregional Basins

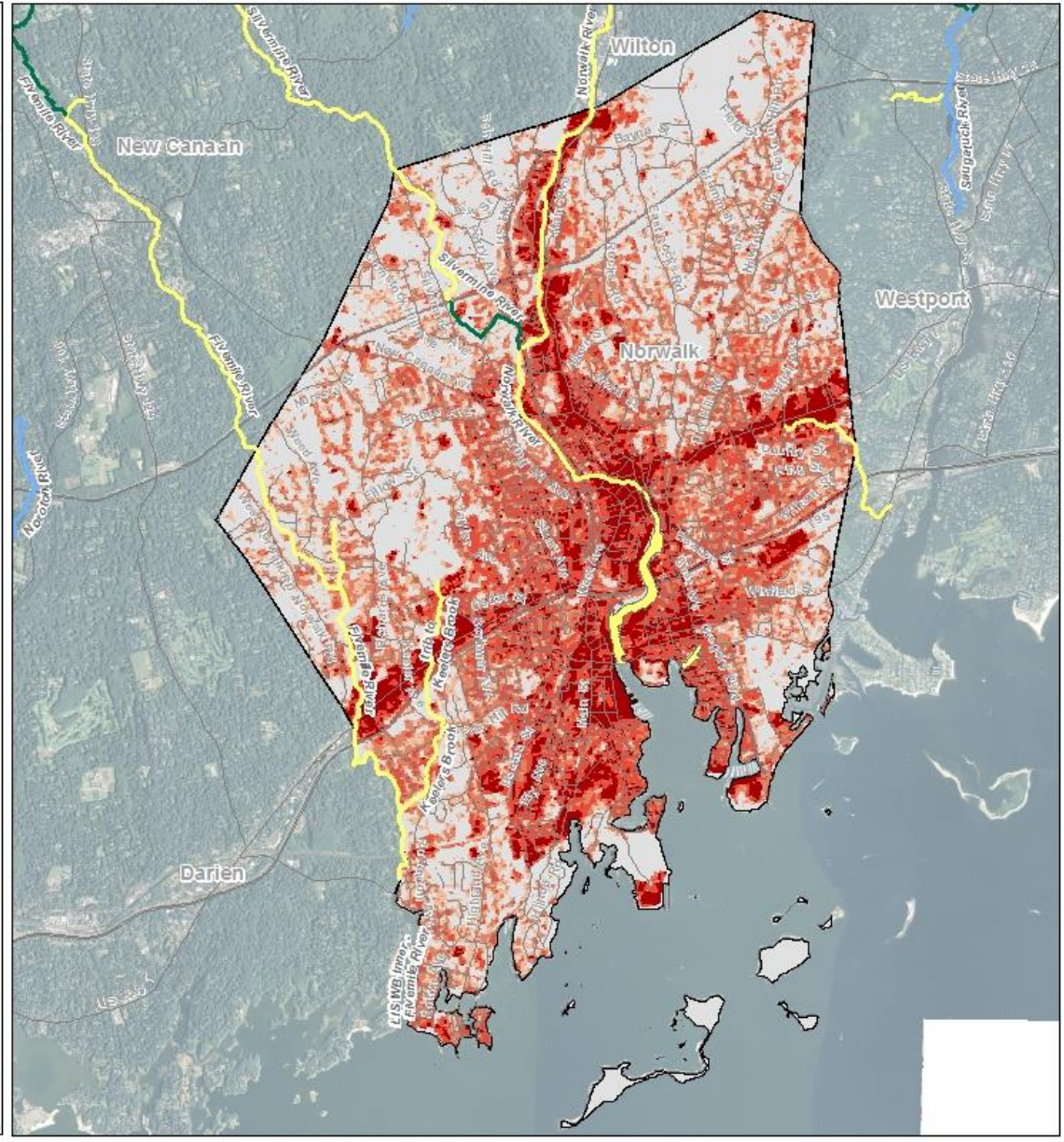
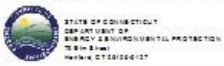


Darien River	Silvermine River
Fivemile River	Southwest Shoreline
Norwalk River	West Branch Saugatuck River
Saugatuck River	



These maps were created using the National Land Cover Database (NLCD) 2011 Impervious Cover Percent Data. For more detail please review the metadata document.

Impervious cover (IC) refers to hard surfaces across the landscape such as pavement or buildings. These hard surfaces do not absorb water and prevent rain from soaking in to the ground. As a result, runoff occurs and easily carries pollutants to nearby lakes and streams.



## Waters Designated For Shellfishing in the Town of Norwalk

Percent Impervious Cover	Designated For Shellfishing
0-11%	Fully Supporting
12-25%	Not Supporting
26-50%	Unassessed
51-75%	
76-100%	

### Subregional Basins



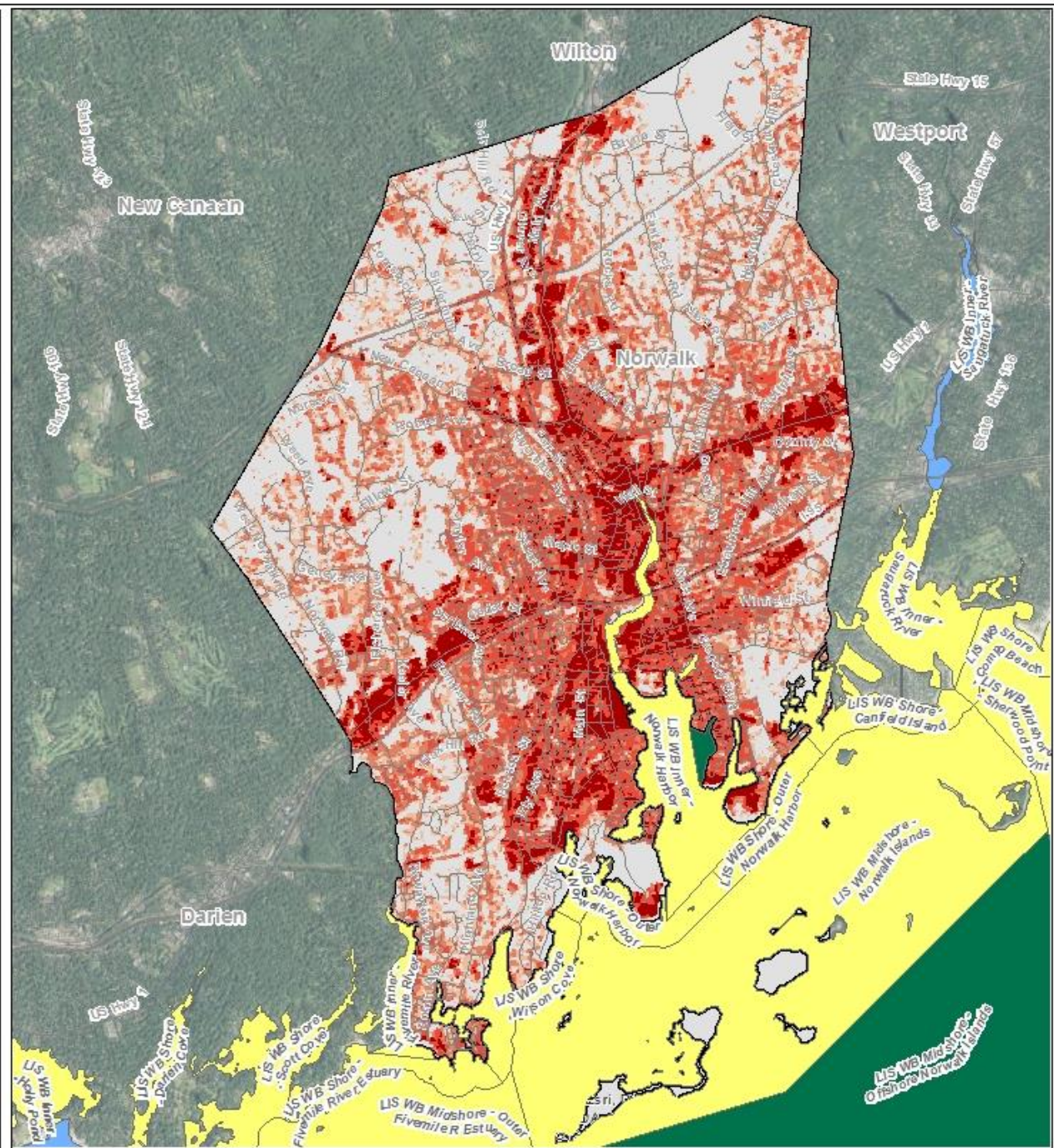
Darien River	Silvermine River
Fivemile River	Southwest Shoreline
Norwalk River	West Branch Saugatuck River
Saugatuck River	



0 0.75 1.5 Miles

These maps were created using the National Land Cover Database (NLCD) 2011 Impervious Cover Percent Data. For more detail please review the metadata document.

Impervious cover (IC) refers to hard surfaces across the landscape such as pavement or buildings. These hard surfaces do not absorb water and prevent rain from soaking into the ground. As a result, runoff occurs and easily carries pollutants to nearby lakes and streams.



## **Factsheet: City of Norwich Water Quality and Stormwater Summary**

This document was created for each town that has submitted monitoring data under the current Small Municipal Separate Storm Sewer System (MS4) General Permit. What follows is information on how stormwater can affect water quality in streams and rivers and a summary of data submitted by your town. This factsheet is intended to help you interpret your monitoring results and assist you in compliance with the MS4 program.

### Water Quality in Connecticut

Surface waters are important resources that support numerous uses, including water supply, recreation, fishing, shellfishing and sustaining aquatic life. Water quality conditions needed to support these uses are identified within the Connecticut Water Quality Standards (WQS). In order to protect and restore these uses, we need acceptable environmental conditions (physical, chemical and biological) to be present within surface waters.

To assess and track water quality conditions, CT DEEP conducts monitoring across the State. The data is synthesized into a biennial state water quality report called the Integrated Water Quality Report. Currently, specific water quality monitoring in the state encompasses about 50% of rivers, 47% of lakes, and 100% of estuary/coastline. In addition, CT DEEP may have information about certain land uses or discharges which could indicate a potential for water quality to be impacted, even if the waterbody has not been fully monitored and assessed.

To find more detailed information on water quality in your town, please see the Integrated Water Quality Report (IWQR) on the CT DEEP website at [www.ct.gov/deep/iwqr](http://www.ct.gov/deep/iwqr). Information on water quality within your town is also presented on the maps included in this fact sheet.

### Impacts of Impervious Cover on Water Quality

Impervious cover (IC) refers to hard surfaces across the landscape such as roads, sidewalks, parking lots and roofs. Studies have focused on the amount of hard surfaces to evaluate the impacts of stormwater runoff from these hard surfaces on water quality and found that IC affects both the quantity and quality of stormwater. IC forces rain to runoff the land, carrying pollutants quickly and directly to lakes and streams instead of soaking into the ground and being filtered by the soil. For more information on impervious cover, please see the CT DEEP web page [www.ct.gov/deep/imperviouscoverstudies](http://www.ct.gov/deep/imperviouscoverstudies) and EPA's web page [www.epa.gov/caddis/ssr\\_urb\\_isl.html](http://www.epa.gov/caddis/ssr_urb_isl.html).

In general, the higher the percentage of IC in a watershed, the poorer the surface water quality. Research in Connecticut strongly suggests that aquatic life will be harmed when the IC within a

watershed exceeds 12%. Stormwater pollution from IC is a likely cause of impairment for these waterbodies.

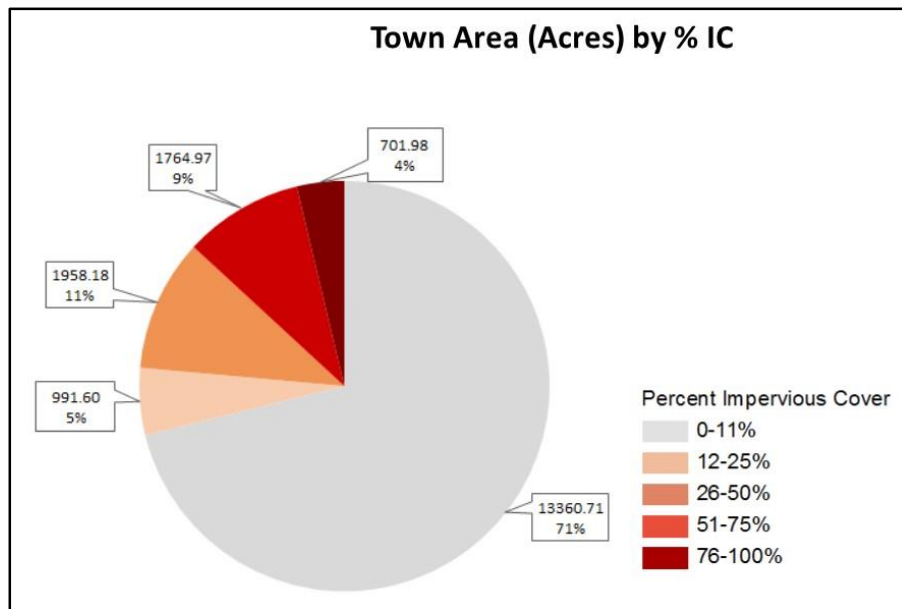
### City of Norwich: Impervious Cover Data

This chart shows the amount of area within your town that contains IC. Data is grouped by acres and percent IC. While all levels of IC can contribute stormwater to streams, it is important to note that land with IC greater than 12% in town is likely to be contributing enough stormwater to streams to have a negative impact on water quality.

Towns should aim to make stormwater improvements in areas with IC greater than 12% in an effort to reduce the amount of stormwater pollution reaching surface waters which will protect and improve water quality.

For more information on areas of impervious cover within your town, please see the maps at the back of this factsheet.

Amounts of Impervious Cover within the City of Norwich



### Pollution Reduction

Waterbodies often can handle a certain amount of pollutants and still maintain good water quality. However, impaired waterbodies have too much pollution impacting their water quality and therefore the streams do not support all uses for the waterbody. Total Maximum Daily Loads (TMDLs) are pollution reduction budgets developed for impaired waterbodies in order to meet water quality. If the pollution budget is achieved through the recommended pollution reduction measures, then the waterbody is expected to meet water quality. CT DEEP also supports impaired waters restoration through watershed based plans ([www.ct.gov/deep/watershed](http://www.ct.gov/deep/watershed)) which

provide more specific non-point source pollution control measures. The following TMDLs or pollution reduction strategies have been developed and apply to areas within your town.

TMDLs or Strategies Applicable to the City of Norwich

<b>Name of TMDL or Strategy</b>	<b>Pollutant</b>	<b>Waterbody Name</b>	<b>Link</b>
Statewide Bacteria TMDL	Bacteria	Shetucket River	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/shetucketriver3800.pdf">www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/shetucketriver3800.pdf</a>
Statewide Bacteria TMDL	Bacteria	Thames River / Flat Brook	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/thamesflatbrook3000.pdf">www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/thamesflatbrook3000.pdf</a>
A TMDL Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound	Nitrogen	Long Island Sound and contributing watersheds	<a href="http://www.ct.gov/deep/lib/deep/water/lis_water_quality/nitrogen_control_program/tmdl.pdf">www.ct.gov/deep/lib/deep/water/lis_water_quality/nitrogen_control_program/tmdl.pdf</a>
Northeast Regional Mercury TMDL	Mercury	All CT Inland waters	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/ne_hg_tmdl.pdf">www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/ne_hg_tmdl.pdf</a>
Interim Phosphorus Reduction Strategy	Phosphorus	Certain CT Inland waters	<a href="http://www.ct.gov/deep/lib/deep/water/water_quality_standards/p/interimmgntphosstrat_042614.pdf">www.ct.gov/deep/lib/deep/water/water_quality_standards/p/interimmgntphosstrat_042614.pdf</a>

For more information on these TMDLs or strategies please go to our website [www.ct.gov/deep/tmdl](http://www.ct.gov/deep/tmdl).

Stormwater Quality Monitoring

Regular monitoring for targeted pollutants in stormwater provides an indication of potential for water quality impacts and helps identify sources and unlawful discharges. Annual monitoring at 6 locations from different areas of town has been a requirement of the MS4 permit since 2004. CT DEEP uses that information to evaluate the quality of stormwater and the potential for impacts to surface waters as well as to make sure that stormwater is managed properly.

Below are 5 graphs tracking stormwater results submitted by your town for 5 parameters reported under the current MS4 General Permit. The results of each stormwater test submitted to CT DEEP by your town is shown. Individual sample results are shown in grey while the average of the samples collected on a particular day is shown in blue, with a line connecting the averages for the various sample dates. The bars show the statistical range of samples for each day with the red squares showing results which are considered to be outliers, that is, very different from

the other samples collected on that day. The chart on the graph lists the sample dates and some basic statistics:

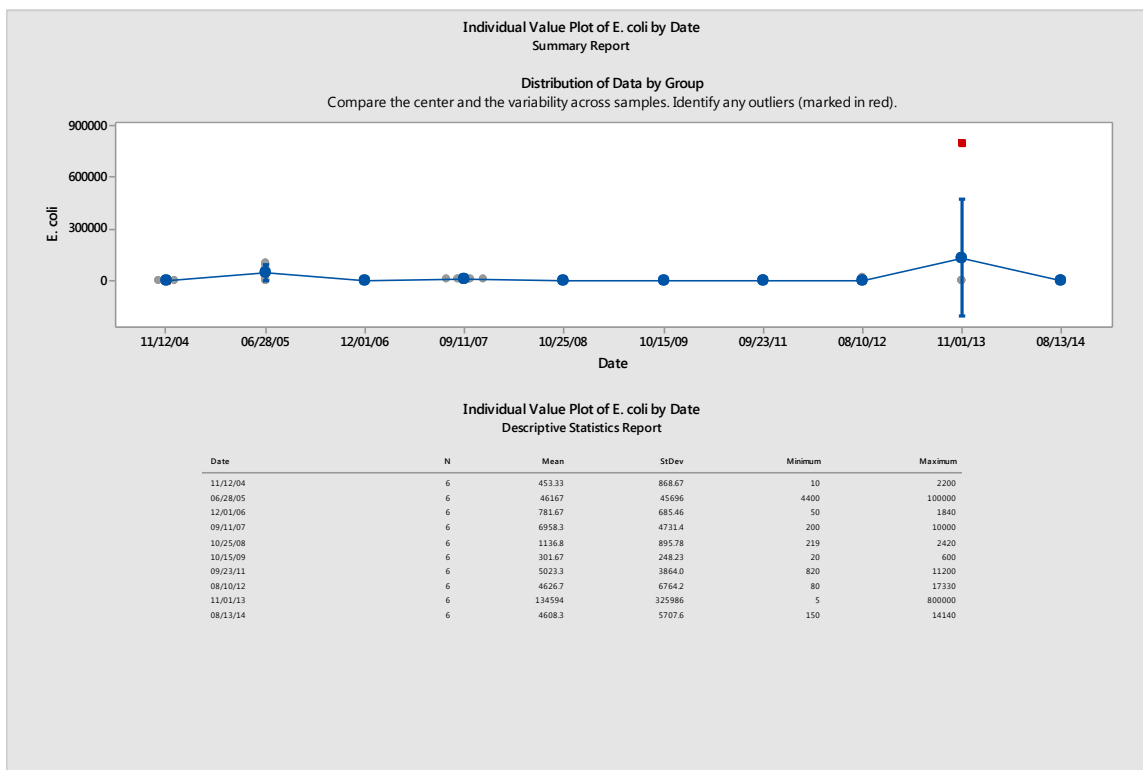
<b>Statistic</b>	<b>Description</b>
N	Number of stormwater samples collected on that date
Mean	Average of the results reported for that sample date
Standard Deviation (StdDev)	A measure of the variability of the results for the sample date
Minimum	The lowest sample result for the sample date
Maximum	The highest sample result for the sample date

### Bacteria

*Escherichia coli* (*E. coli*) is a bacteria that lives in the intestines of humans and other warm-blooded animals and is used to indicate the presence of fecal matter in surface waters. Some strains of *E. coli* and other pathogens found in fecal material cause serious illness in people coming in contact with it. For this reason, high amounts of bacteria will cause authorities to close beaches for swimming. Bacteria is measured as the number of colony forming units, or CFU, per 100 ml of water. Any result that was reported as “to numerous to count” is included on the chart as 800,000 CFU/100 mL.



Results of annual stormwater monitoring under MS4 permit for *E.coli* (CFU/ 100 mL of sample)  
City of Norwich

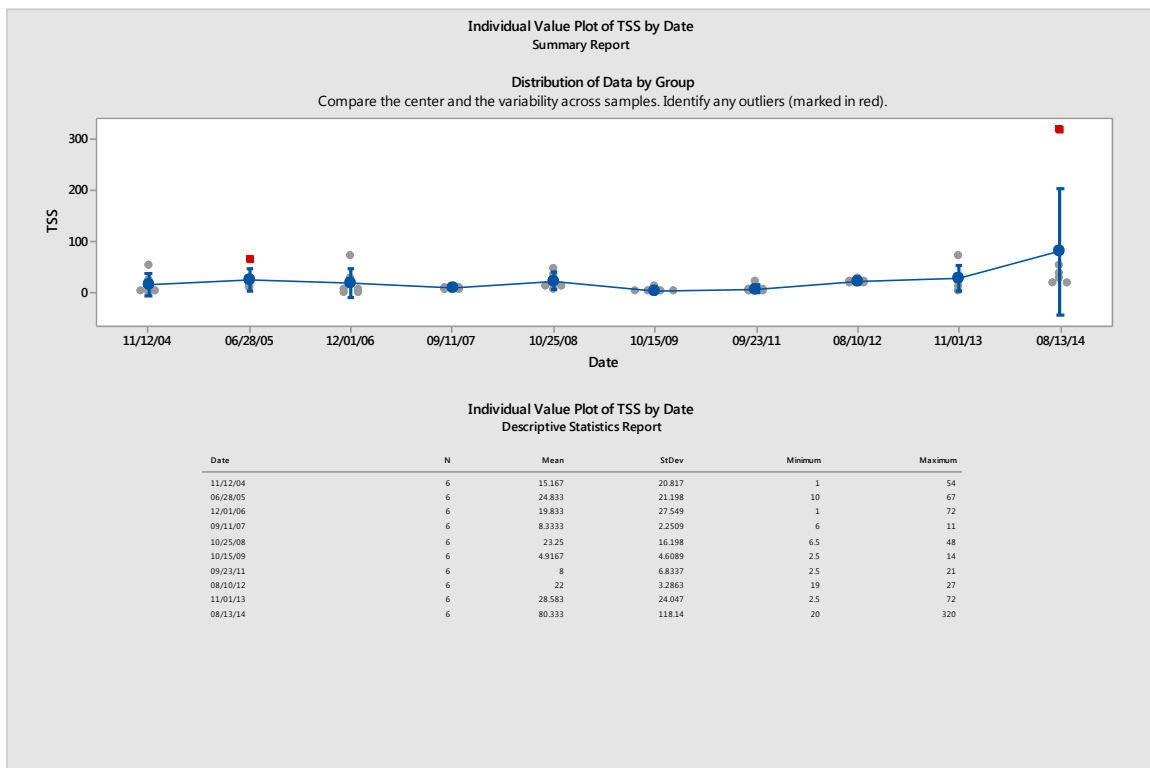


To support recreational uses of surface waters, the CT DEEP Water Quality Standards indicate that the average amount of *E. coli* found in a freshwater water body should be less than 126 CFU/100 mL and that a single sample tested for *E. coli* should be less than 235 CFU/100 mL at a designated swimming area and less than 410 CFU/100 mL in other areas. Monitoring for *E. coli* is currently required in the MS4 permit. Enterococci is another bacteria used to indicate the presence of fecal material in salt water environments. For recreation in salt water the Water Quality Standards indicate that average amount of Enterococci should be less than 35 CFU/100 mL in a designated swimming area and that a single sample tested for Enterococci should be less than 104 CFU/100 mL and in all other areas less than 500 CFU/100 mL. These targets have been included in the statewide bacteria TMDLs. In the Draft MS4 permit, *E.coli* results higher than 235 CFU/100 mL at a designated swimming area or greater than 410 CFU/100 mL in other areas requires a follow-up investigation. Individual stormwater sample results that exceed the applicable single sample maximum value for bacteria could impact water quality, so the associated outfalls should be evaluated for additional stormwater management.

## Total Suspended Solids

Total Suspended Solids (TSS) is a measurement of the amount of solids (including sand and silt) found in the stormwater sample. High concentrations of TSS can lower water quality in the receiving stream by transporting various pollutants to the waterbody where they can directly affect aquatic life or affect aquatic life by absorbing light, reducing photosynthesis, and by making the water warmer. TSS can also clog fish gills and smother fish eggs and suffocate the organisms that fish eat. TSS comes from erosion and is found in agricultural, urban and industrial runoff. TSS can be reduced by protecting land from erosion and allowing stormwater time to settle before discharging to surface waters.

### Results of annual stormwater monitoring under the MS4 general permit for TSS (mg/L) City of Norwich

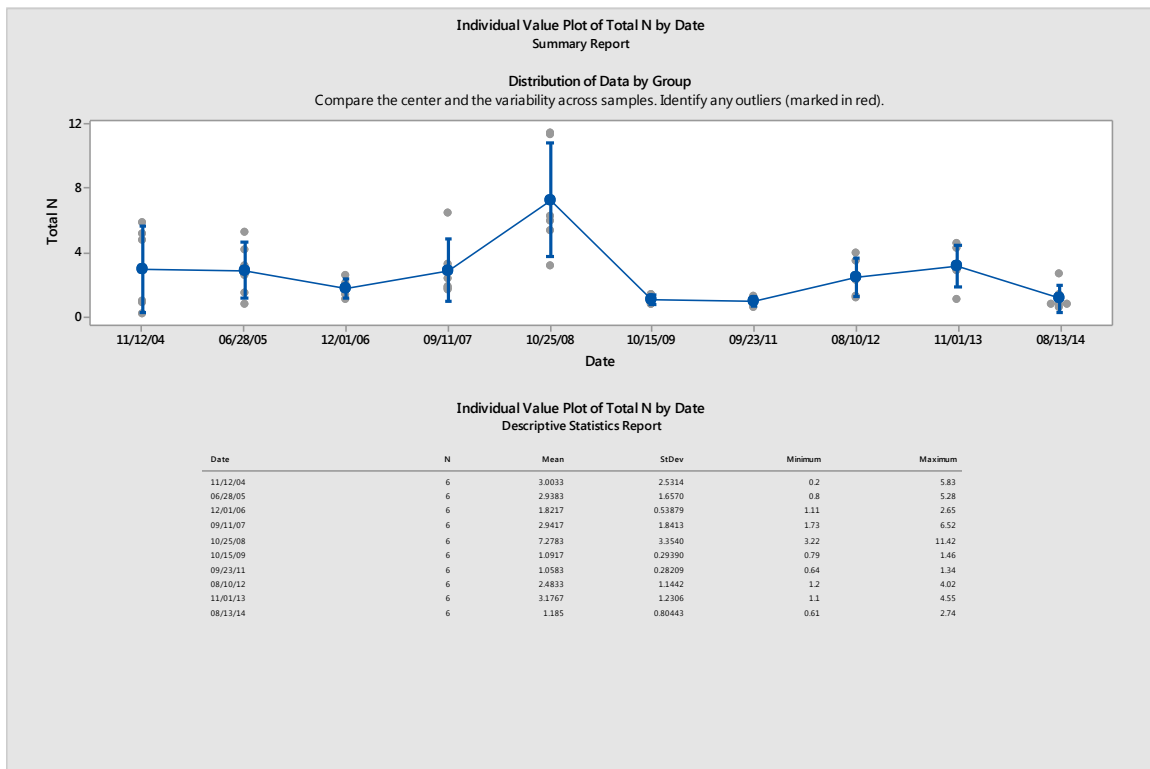


Currently, there is not a water quality based target for TSS in stormwater but TSS is a general indicator of water quality and, lower amounts of TSS are better. For comparison purposes, the average MS4 stormwater result reported for TSS by all towns covered by this permit is 48 mg/L. Areas within your town which have elevated TSS may be places to consider additional stormwater management efforts.

## Total Nitrogen

Nitrogen is an important nutrient in marine and estuarine waters such as Long Island Sound, as well as a concern in fresh water lakes and rivers. High amounts of nitrogen can lead to excessive growth of water plants and algae which then reduces the amount of oxygen available to living things in these waters. Unlawful discharges, animal waste, failing septic systems, leaves, litter and fertilizers are common sources of high nitrogen in stormwater. Responsible use of fertilizers, maintaining septic systems and proper disposal of pet waste will help reduce nitrogen in stormwater.

### Results of annual stormwater monitoring under MS4 general permit for total nitrogen (Total N mg/L) City of Norwich

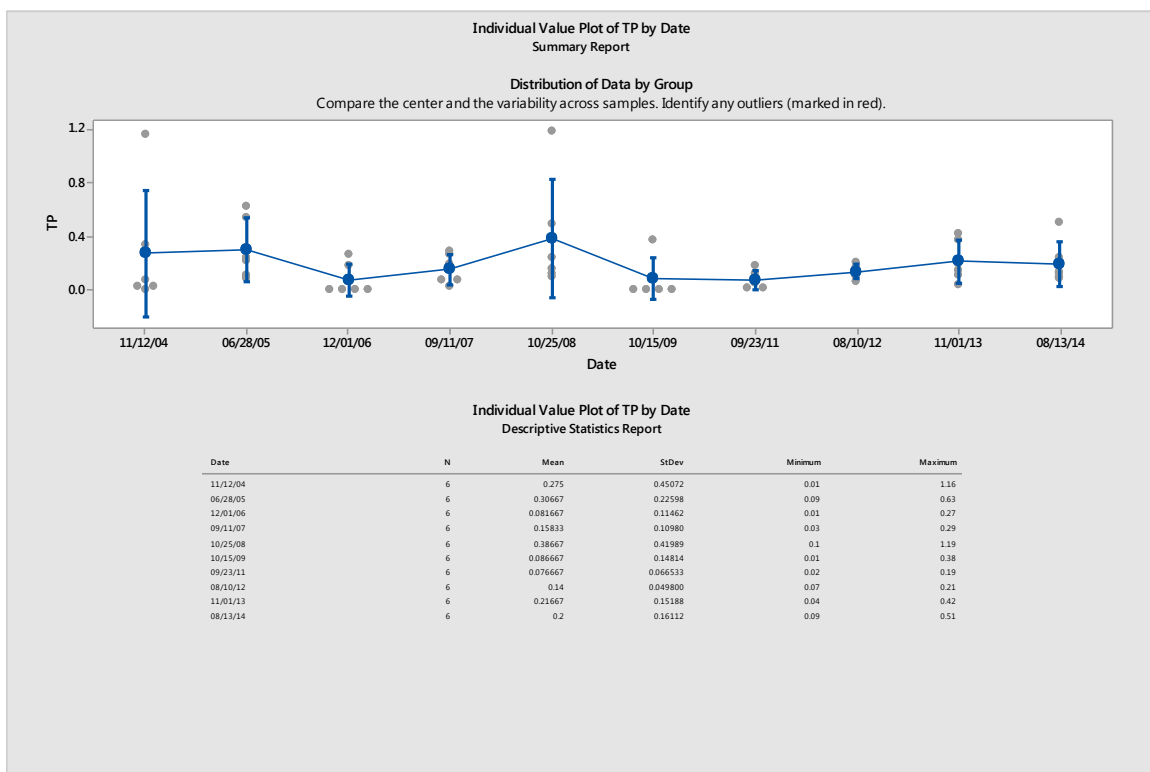


The TMDL for Long Island Sound requires a 10% reduction of nitrogen in stormwater discharges to prevent low oxygen conditions in Long Island Sound. Each town should be working to reduce the amount of nitrogen in their stormwater to address this issue. Under the current draft MS4 permit, any result for total nitrogen greater than 2.5 mg/L will require a follow-up investigation. Areas within your town which have elevated nitrogen may be places to consider additional stormwater management activities.

## Total Phosphorus

Phosphorus is an important nutrient necessary for growth in plants and animals in freshwater. Too much phosphorus in the water can throw off the balance of aquatic ecosystems causing excessive growth of water plants and algae blooms, which reduces the amount of oxygen in the water, potentially harming the fish. Sometimes these algae blooms can contain toxic forms of algae which are harmful to people and animals that come into contact with it. Sources of high phosphorus can be unlawful discharges, fertilizers, litter, leaves, erosion and animal waste.

### Results of annual stormwater monitoring under MS4 permit for total phosphorus (mg/L) City of Norwich

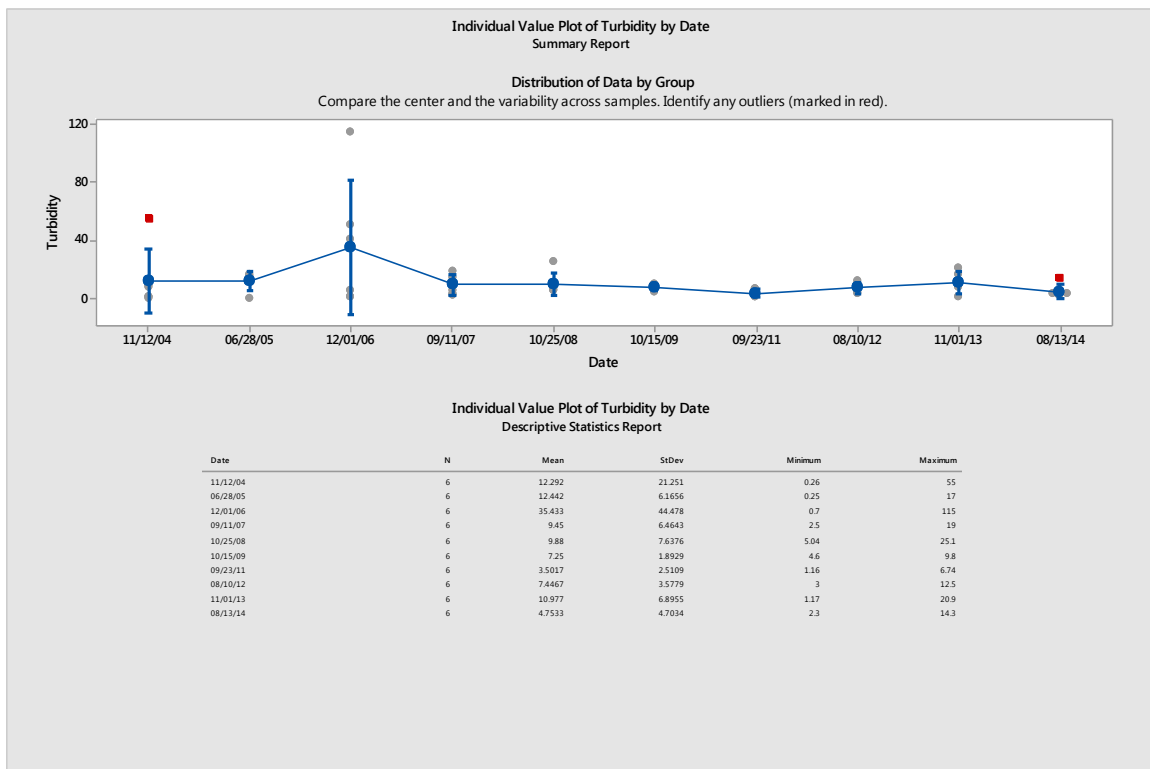


CT DEEP is actively working with many towns to reduce the amount of phosphorus reaching Connecticut's streams and rivers. Under the current draft MS4 permit, a total phosphorus result greater than 0.3 mg/L will require a follow-up investigation. Areas of your town that have elevated levels of phosphorus in the stormwater are good places to develop additional stormwater controls.

## Turbidity

Turbidity measures the clarity of the stormwater sample. It measures how much material (soil, algae, pollution, microbes etc.) is suspended in the sample. High turbidity lowers the water quality of a surface water by blocking sunlight for the plants and makes food harder for the fish to find and may be an indication of a higher amounts of other pollution in the water. Surface waters with high turbidity are visually less appealing for recreational use. High turbidity can be caused by erosion, failing septic systems, decaying plants or animals, and excessive algae growth. Turbidity is reported in Nephelometric Turbidity Units (NTU) which is related to how easily light passes through the water sample.

### Results of annual stormwater monitoring under MS4 permit for turbidity (NTU) City of Norwich



The Water Quality Standards have a criterion that indicates turbidity should not to exceed 5 NTU above ambient levels. In the draft MS4 permit, a turbidity result greater than 5 NTU over in-stream conditions will require a follow-up investigation. While there is not a fixed statewide criterion for turbidity, lower results are better for the health of the surface waters in town. Areas with higher levels of turbidity in stormwater would be a good place to develop additional stormwater controls.

## Town Maps

The following maps were created to show the impervious cover (IC) in your town as well as the water quality in the rivers, streams, lakes and estuaries in and around your town.

### *Impervious Cover on the Town Maps*

IC is shown in red on the maps. Dark red areas indicate a higher percentage of IC, lighter red areas have less IC, while the grey areas indicate very little or no IC.

### *Water Quality on the Town Maps*

Separate maps are provided for the different uses of the waterbodies such as Aquatic Life Uses, Recreation, and Shellfishing (in coastal towns). The waterbodies are colored to show the health of the waterbody. Green means that the waterbody meets the water quality requirements to fully support the specified use. Yellow means that water quality is poor and that the specified use is not met. Blue means that there is not enough information to know whether or not water quality is good or bad to support the specified use. Additionally, a small map is provided on the left side of each larger map to show which watersheds are within your town.

# Waters Designated For Aquatic Life in the Town of Norwich

Percent Impervious Cover	Designated For Aquatic Life
0-11%	Fully Supporting
12-25%	Not Supporting
26-50%	Unassessed
51-75%	
76-100%	

## Subregional Basins

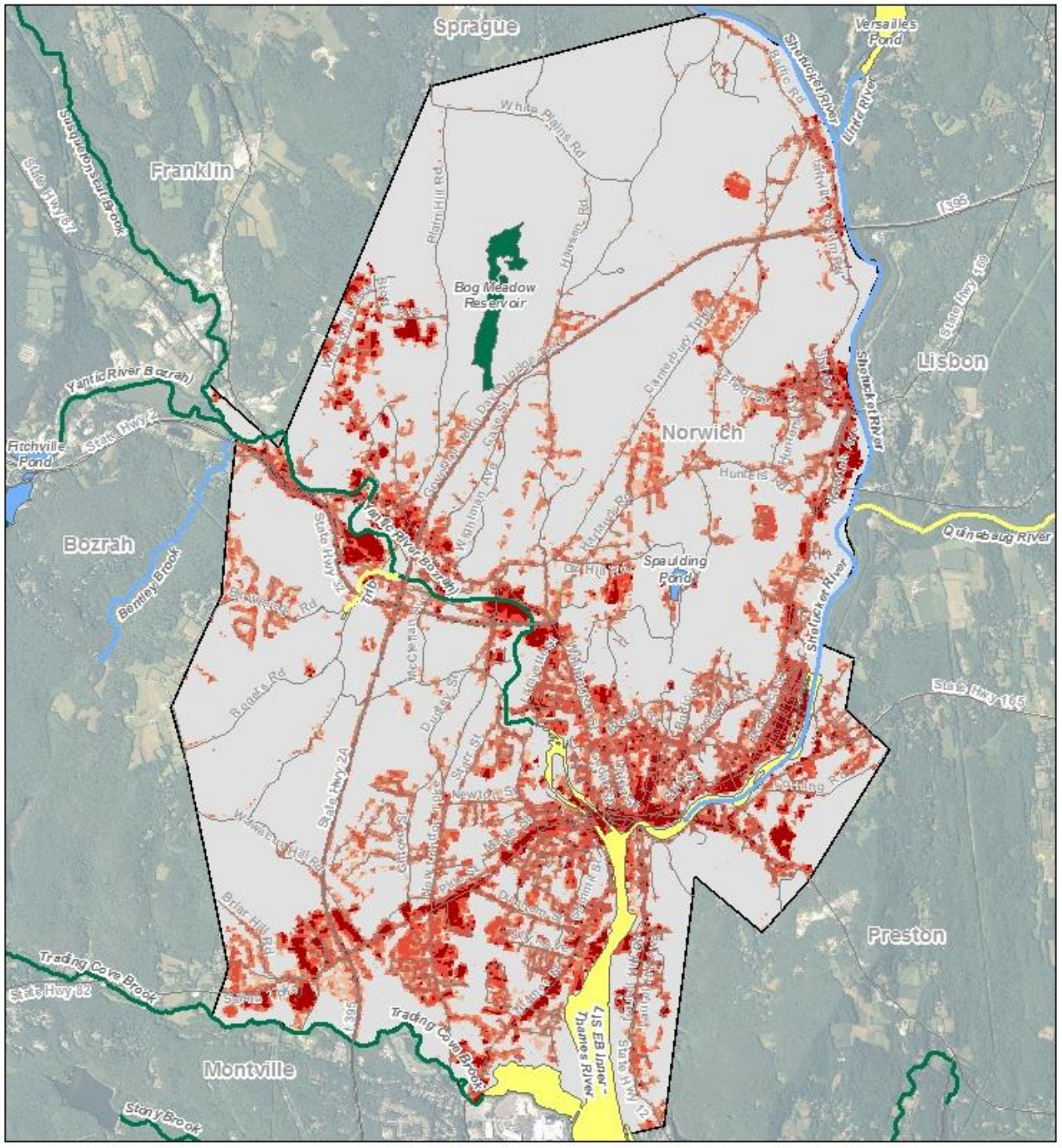


Beaver Brook	Thames River
Poquetanuck Brook	Trading Cove Brook
Shetucket River	Yantic River
Susquehanna Brook	



These maps were created using the National Land Cover Database (NLCD) 2011 Impervious Cover Percent Data. For more detail please review the metadata document.

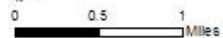
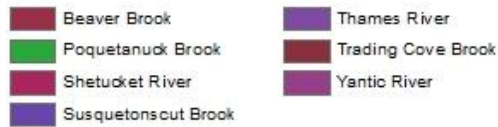
Impervious cover (IC) refers to hard surfaces across the landscape such as pavement or buildings. These hard surfaces do not absorb water and prevent rain from soaking into the ground. As a result, runoff occurs and easily carries pollutants to nearby lakes and streams.



## Waters Designated For Recreation in the Town of Norwich

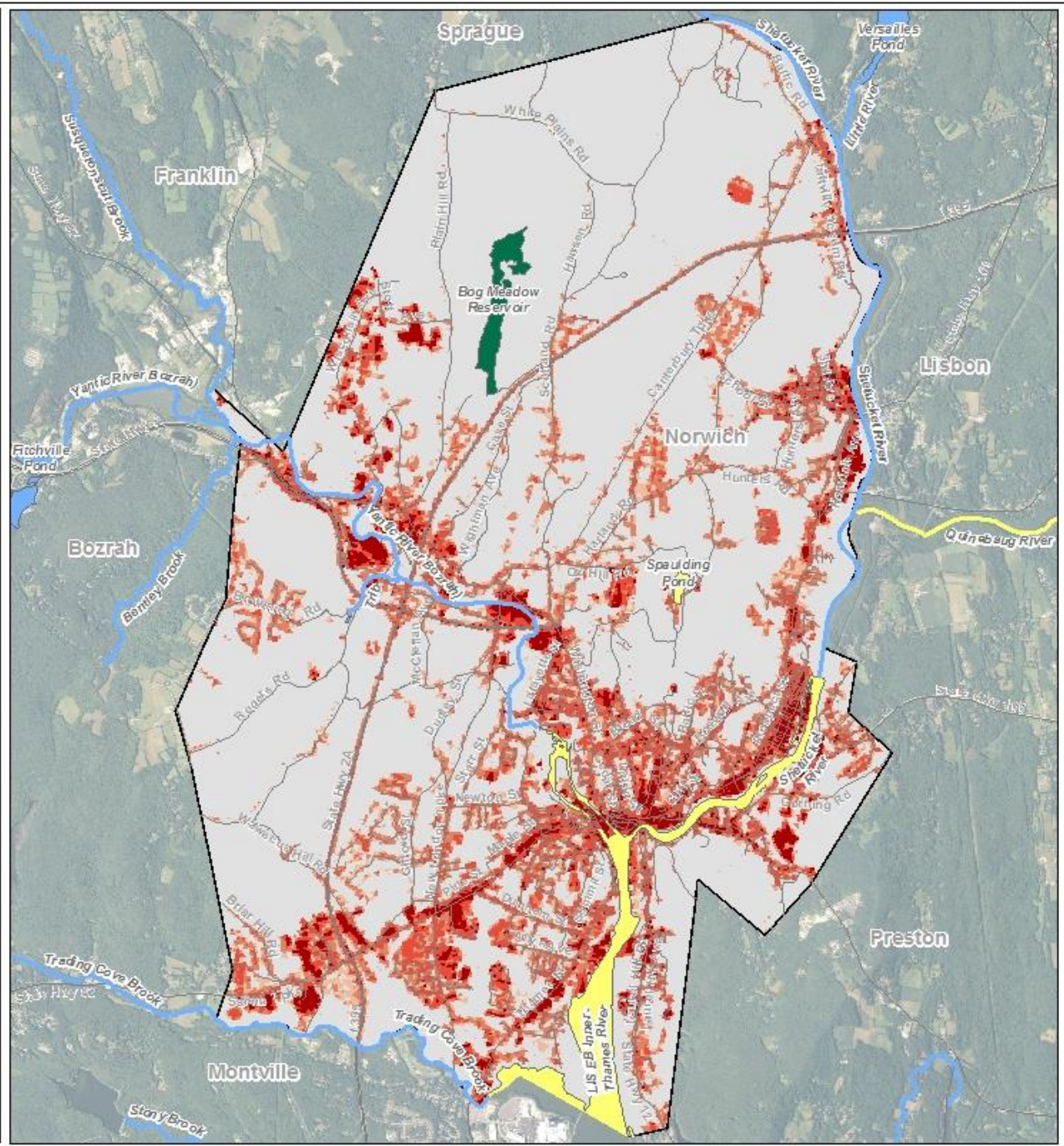


### Subregional Basins



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Impervious cover (IC) refers to hard surfaces across the landscape such as pavement or buildings. These hard surfaces do not absorb water and prevent rain from soaking in to the ground. As a result, runoff occurs and easily carries pollutants to nearby lakes and streams.





# Waters Designated For Shellfishing in the Town of Norwich

Percent Impervious Cover	Designated For Shellfishing
0-11%	Fully Supporting
12-25%	Not Supporting
26-50%	Unassessed
51-75%	
76-100%	

## Subregional Basins



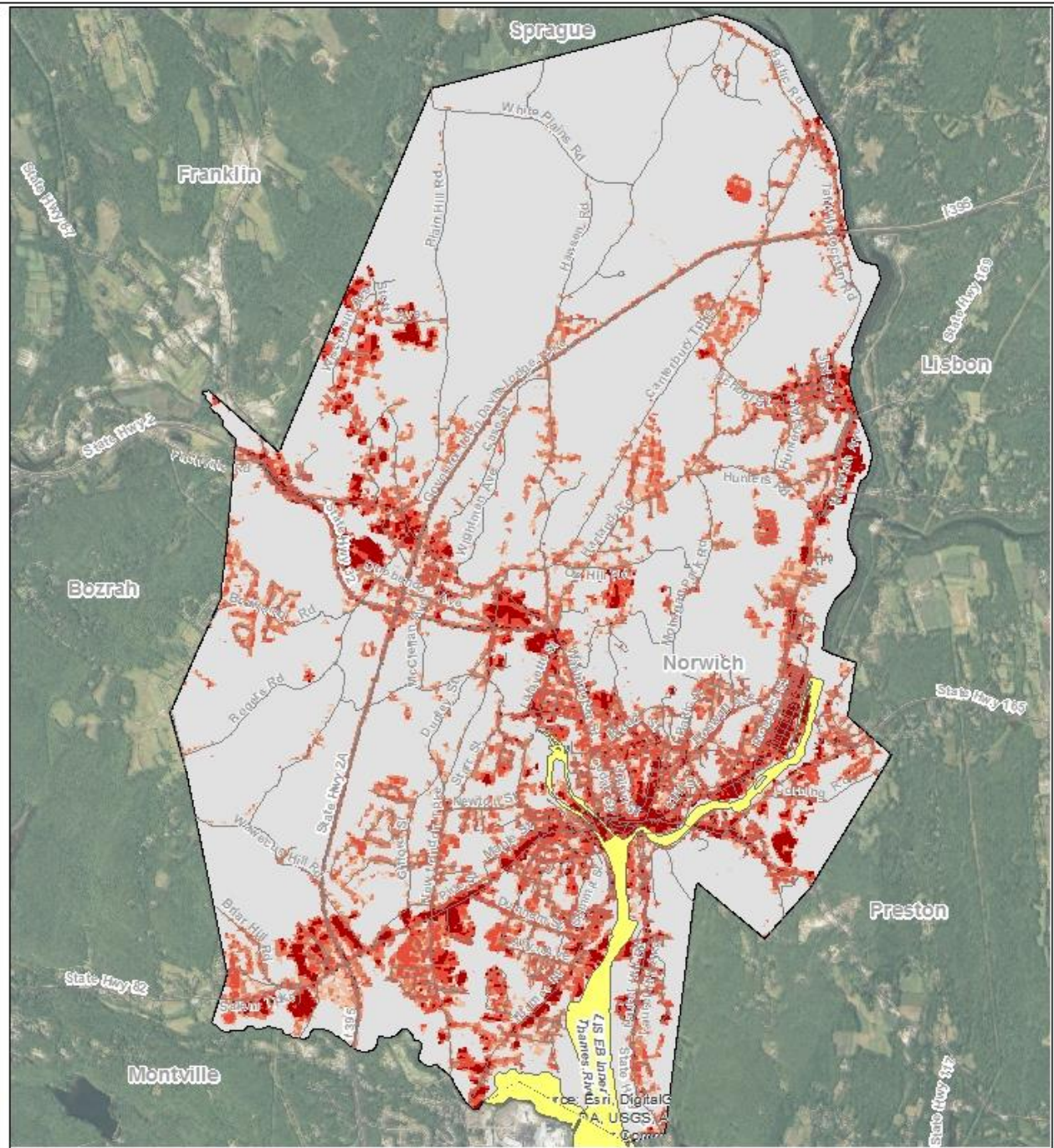
Beaver Brook	Thames River
Poquetanuck Brook	Trading Cove Brook
Shetucket River	Yantic River
Susquetonscut Brook	



0 0.5 1 Miles

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## **Factsheet: Town of Old Lyme Water Quality and Stormwater Summary**

This document was created for each town that has submitted monitoring data under the current Small Municipal Separate Storm Sewer System (MS4) General Permit. What follows is information on how stormwater can affect water quality in streams and rivers and a summary of data submitted by your town. This factsheet is intended to help you interpret your monitoring results and assist you in compliance with the MS4 program.

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In general, the higher the percentage of IC in a watershed, the poorer the surface water quality. Research in Connecticut strongly suggests that aquatic life will be harmed when the IC within a

watershed exceeds 12%. Stormwater pollution from IC is a likely cause of impairment for these waterbodies.

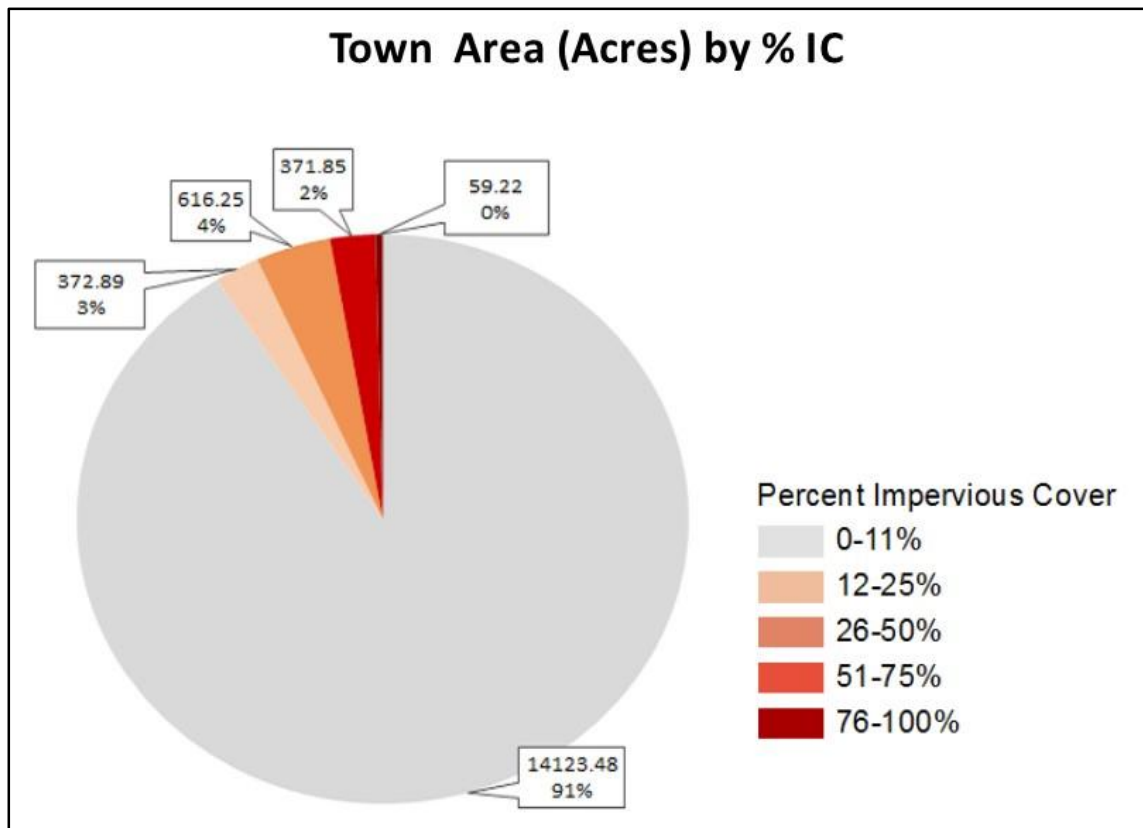
### Town of Old Lyme: Impervious Cover Data

This chart shows the amount of area within your town that contains IC. Data is grouped by acres and percent IC. While all levels of IC can contribute stormwater to streams, it is important to note that land with IC greater than 12% in town is likely to be contributing enough stormwater to streams to have a negative impact on water quality.

Towns should aim to make stormwater improvements in areas with IC greater than 12% in an effort to reduce the amount of stormwater pollution reaching surface waters which will protect and improve water quality.

For more information on areas of impervious cover within your town, please see the maps at the back of this factsheet.

Amounts of Impervious Cover within the Town of Old Lyme



## Pollution Reduction

Waterbodies often can handle a certain amount of pollutants and still maintain good water quality. However, impaired waterbodies have too much pollution impacting their water quality and therefore the streams do not support all uses for the waterbody. Total Maximum Daily Loads (TMDLs) are pollution reduction budgets developed for impaired waterbodies in order to meet water quality. If the pollution budget is achieved through the recommended pollution reduction measures, then the waterbody is expected to meet water quality. CT DEEP also supports impaired waters restoration through watershed based plans ([www.ct.gov/deep/watershed](http://www.ct.gov/deep/watershed)) which provide more specific non-point source pollution control measures. The following TMDLs or pollution reduction strategies have been developed and apply to areas within your town.

### TMDLs or Strategies Applicable to the Town of Old Lyme

<b>Name of TMDL or Strategy</b>	<b>Pollutant</b>	<b>Waterbody Name</b>	<b>Link</b>
Statewide Bacteria TMDL	Bacteria	Estuary 13: Old Saybrook and Old Lyme	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/final_estuary_13-old_saybrook_old_lyme_-_complete.pdf">www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/final_estuary_13-old_saybrook_old_lyme_-_complete.pdf</a>
Statewide Bacteria TMDL	Bacteria	Connecticut River	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/connecticutriver4000.pdf">www.ct.gov/deep/lib/deep/water/tmdl/statewidebacteria/connecticutriver4000.pdf</a>
A TMDL Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound	Nitrogen	Long Island Sound and contributing watersheds	<a href="http://www.ct.gov/deep/lib/deep/water/lis_water_quality/nitrogen_control_program/tmdl.pdf">www.ct.gov/deep/lib/deep/water/lis_water_quality/nitrogen_control_program/tmdl.pdf</a>
Northeast Regional Mercury TMDL	Mercury	All CT Inland waters	<a href="http://www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/ne_hg_tmdl.pdf">www.ct.gov/deep/lib/deep/water/tmdl/tmdl_final/ne_hg_tmdl.pdf</a>
Interim Phosphorus Reduction Strategy	Phosphorus	Certain CT Inland waters	<a href="http://www.ct.gov/deep/lib/deep/water/water_quality_standards/p/interimmngntphosstrat_042614.pdf">www.ct.gov/deep/lib/deep/water/water_quality_standards/p/interimmngntphosstrat_042614.pdf</a>

For more information on these TMDLs or strategies please go to our website [www.ct.gov/deep/tmdl](http://www.ct.gov/deep/tmdl).

## Stormwater Quality Monitoring

Regular monitoring for targeted pollutants in stormwater provides an indication of potential for water quality impacts and helps identify sources and unlawful discharges. Annual monitoring at 6 locations from different areas of town has been a requirement of the MS4 permit since 2004.

CT DEEP uses that information to evaluate the quality of stormwater and the potential for impacts to surface waters as well as to make sure that stormwater is managed properly.

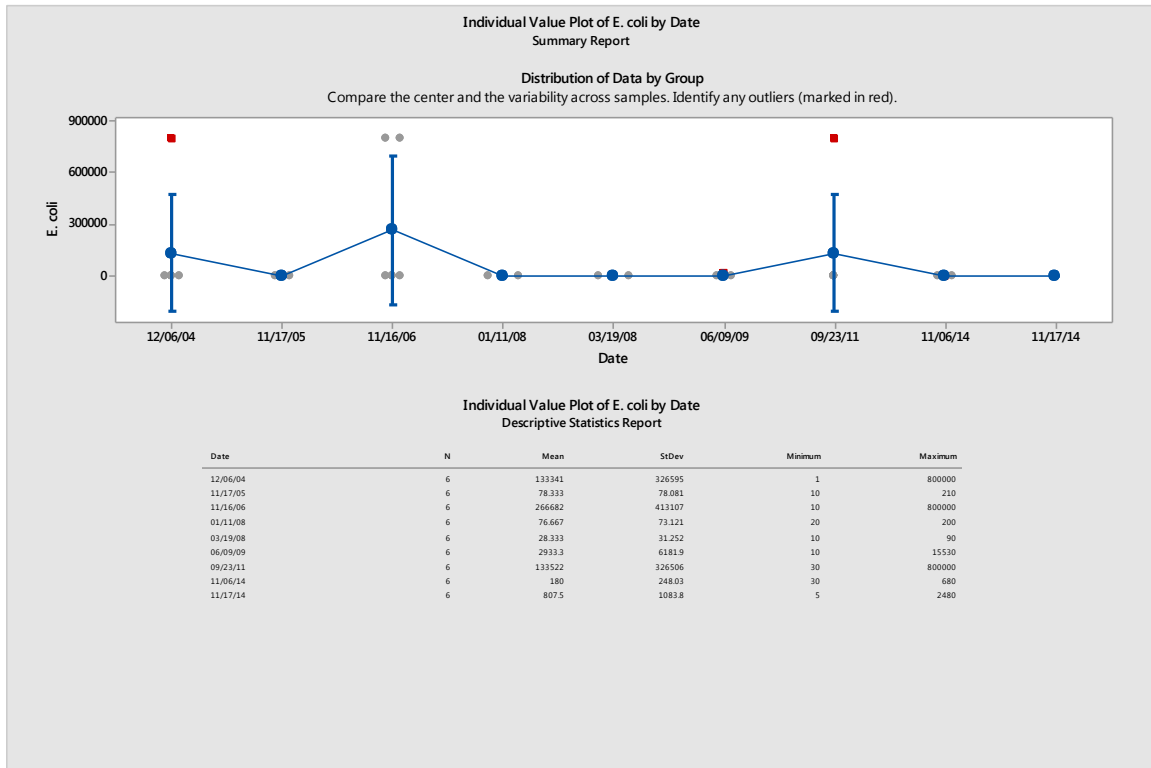
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<b>Statistic</b>	<b>Description</b>
N	Number of stormwater samples collected on that date
Mean	Average of the results reported for that sample date
Standard Deviation (StdDev)	A measure of the variability of the results for the sample date
Minimum	The lowest sample result for the sample date
Maximum	The highest sample result for the sample date

### Bacteria

*Escherichia coli* (*E. coli*) is a bacteria that lives in the intestines of humans and other warm-blooded animals and is used to indicate the presence of fecal matter in surface waters. Some strains of *E. coli* and other pathogens found in fecal material cause serious illness in people coming in contact with it. For this reason, high amounts of bacteria will cause authorities to close beaches for swimming. Bacteria is measured as the number of colony forming units, or CFU, per 100 ml of water. Any result that was reported as “to numerous to count” is included on the chart as 800,000 CFU/100 mL.

Results of annual stormwater monitoring under MS4 permit for *E.coli* (CFU/ 100 mL of sample)  
Town of Old Lyme

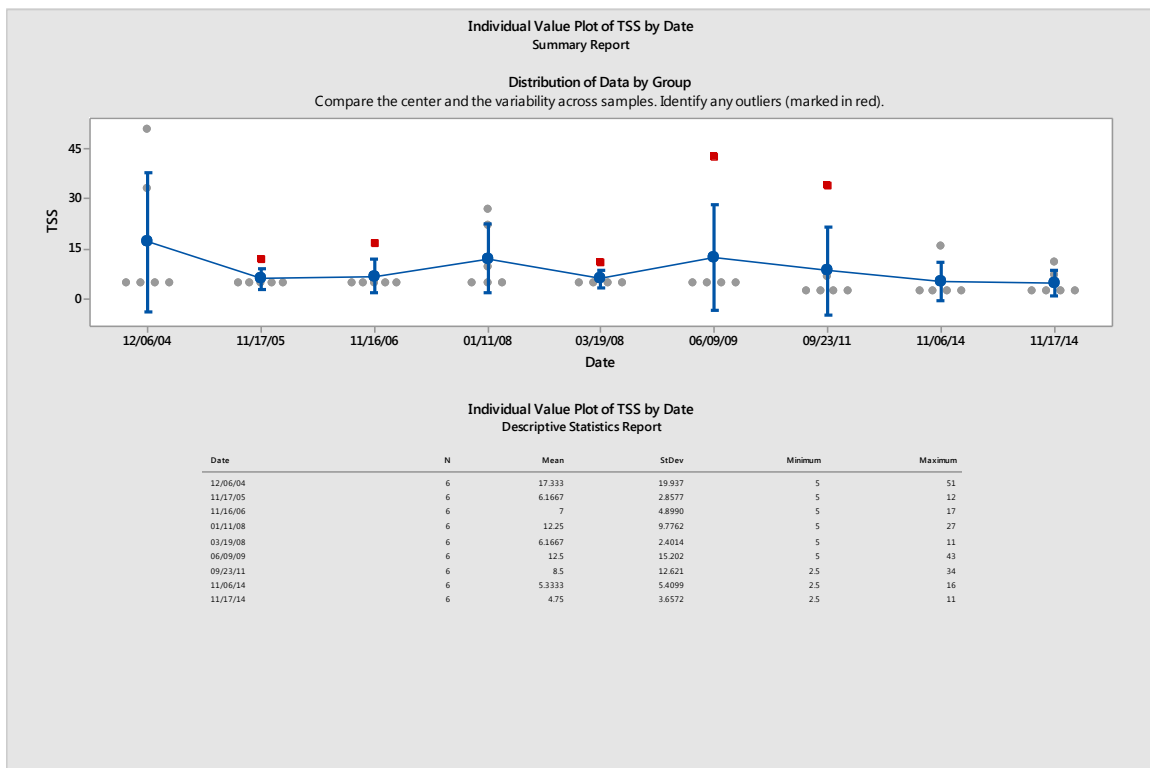


To support recreational uses of surface waters, the CT DEEP Water Quality Standards indicate that the average amount of *E. coli* found in a freshwater water body should be less than 126 CFU/100 mL and that a single sample tested for *E. coli* should be less than 235 CFU/100 mL at a designated swimming area and less than 410 CFU/100 mL in other areas. Monitoring for *E. coli* is currently required in the MS4 permit. Enterococci is another bacteria used to indicate the presence of fecal material in salt water environments. For recreation in salt water the Water Quality Standards indicate that average amount of Enterococci should be less than 35 CFU/100 mL in a designated swimming area and that a single sample tested for Enterococci should be less than 104 CFU/100 mL and in all other areas less than 500 CFU/100 mL. These targets have been included in the statewide bacteria TMDLs. In the Draft MS4 permit, *E.coli* results higher than 235 CFU/100 mL at a designated swimming area or greater than 410 CFU/100 mL in other areas requires a follow-up investigation. Individual stormwater sample results that exceed the applicable single sample maximum value for bacteria could impact water quality, so the associated outfalls should be evaluated for additional stormwater management.

## Total Suspended Solids

Total Suspended Solids (TSS) is a measurement of the amount of solids (including sand and silt) found in the stormwater sample. High concentrations of TSS can lower water quality in the receiving stream by transporting various pollutants to the waterbody where they can directly affect aquatic life or affect aquatic life by absorbing light, reducing photosynthesis, and by making the water warmer. TSS can also clog fish gills and smother fish eggs and suffocate the organisms that fish eat. TSS comes from erosion and is found in agricultural, urban and industrial runoff. TSS can be reduced by protecting land from erosion and allowing stormwater time to settle before discharging to surface waters.

### Results of annual stormwater monitoring under the MS4 general permit for TSS (mg/L) Town of Old Lyme

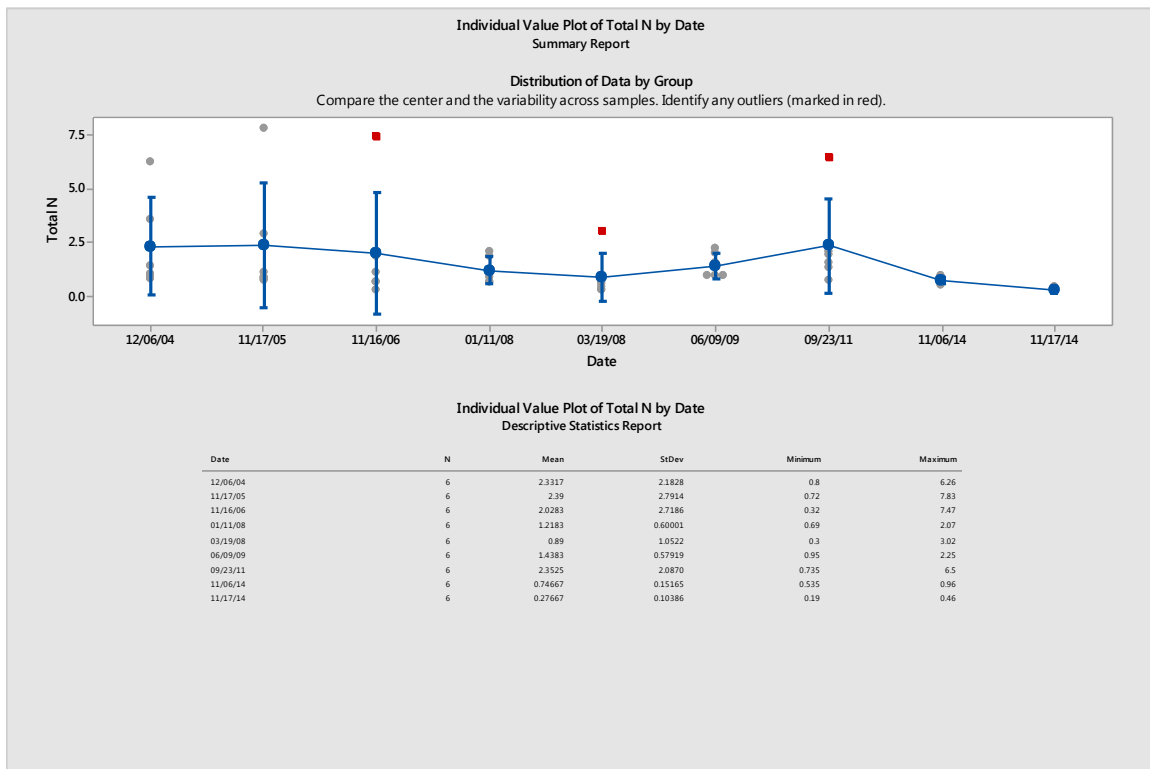


Currently, there is not a water quality based target for TSS in stormwater but TSS is a general indicator of water quality and, lower amounts of TSS are better. For comparison purposes, the average MS4 stormwater result reported for TSS by all towns covered by this permit is 48 mg/L. Areas within your town which have elevated TSS may be places to consider additional stormwater management efforts.

## Total Nitrogen

Nitrogen is an important nutrient in marine and estuarine waters such as Long Island Sound, as well as a concern in fresh water lakes and rivers. High amounts of nitrogen can lead to excessive growth of water plants and algae which then reduces the amount of oxygen available to living things in these waters. Unlawful discharges, animal waste, failing septic systems, leaves, litter and fertilizers are common sources of high nitrogen in stormwater. Responsible use of fertilizers, maintaining septic systems and proper disposal of pet waste will help reduce nitrogen in stormwater.

### Results of annual stormwater monitoring under MS4 general permit for total nitrogen (Total N mg/L) Town of Old Lyme



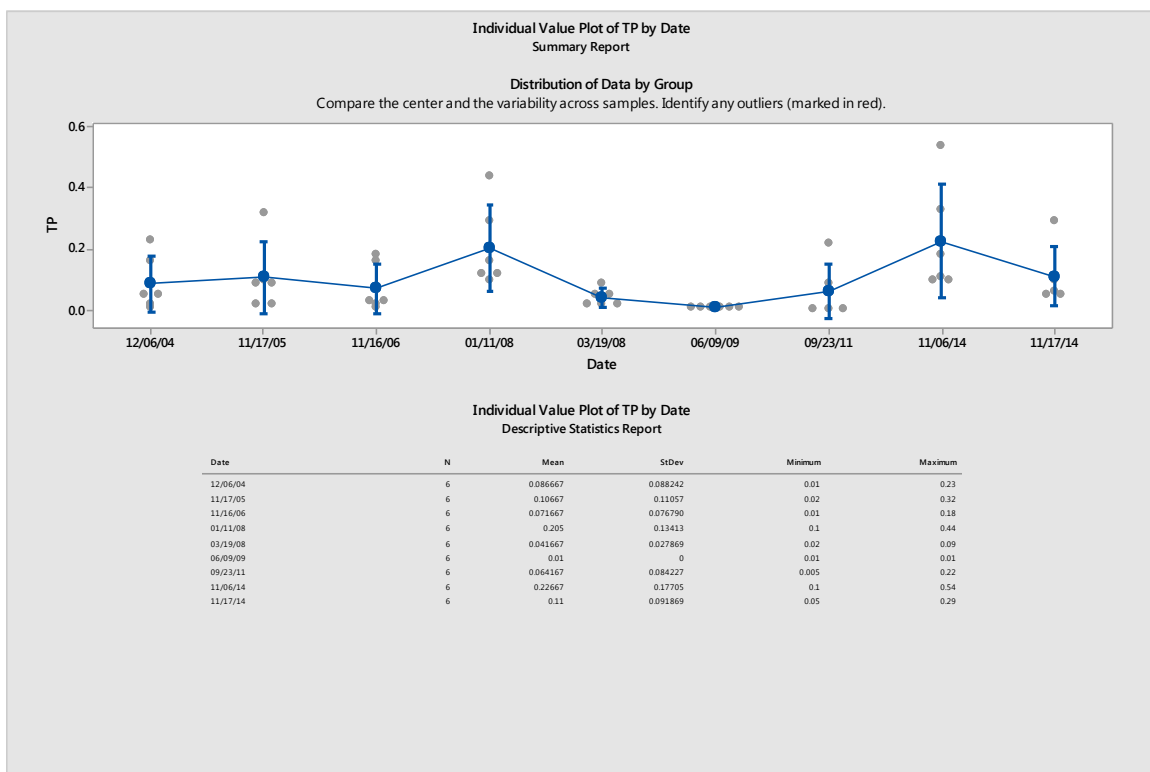
The TMDL for Long Island Sound requires a 10% reduction of nitrogen in stormwater discharges to prevent low oxygen conditions in Long Island Sound. Each town should be working to reduce the amount of nitrogen in their stormwater to address this issue. Under the current draft MS4 permit, any result for total nitrogen greater than 2.5 mg/L will require a follow-up investigation. Areas within your town which have elevated nitrogen may be places to consider additional stormwater management activities.



## Total Phosphorus

Phosphorus is an important nutrient necessary for growth in plants and animals in freshwater. Too much phosphorus in the water can throw off the balance of aquatic ecosystems causing excessive growth of water plants and algae blooms, which reduces the amount of oxygen in the water, potentially harming the fish. Sometimes these algae blooms can contain toxic forms of algae which are harmful to people and animals that come into contact with it. Sources of high phosphorus can be unlawful discharges, fertilizers, litter, leaves, erosion and animal waste.

### Results of annual stormwater monitoring under MS4 permit for total phosphorus (mg/L) Town of Old Lyme

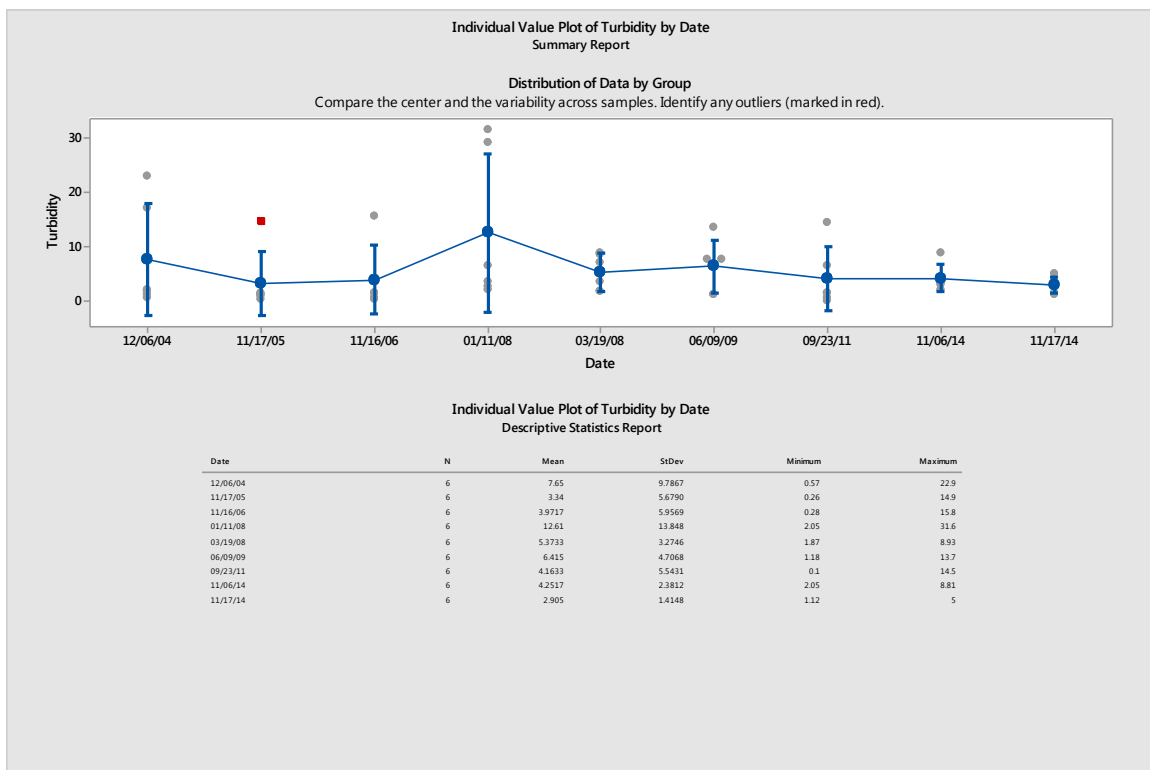


CT DEEP is actively working with many towns to reduce the amount of phosphorus reaching Connecticut's streams and rivers. Under the current draft MS4 permit, a total phosphorus result greater than 0.3 mg/L will require a follow-up investigation. Areas of your town that have elevated levels of phosphorus in the stormwater are good places to develop additional stormwater controls.

## Turbidity

Turbidity measures the clarity of the stormwater sample. It measures how much material (soil, algae, pollution, microbes etc.) is suspended in the sample. High turbidity lowers the water quality of a surface water by blocking sunlight for the plants and makes food harder for the fish to find and may be an indication of a higher amounts of other pollution in the water. Surface waters with high turbidity are visually less appealing for recreational use. High turbidity can be caused by erosion, failing septic systems, decaying plants or animals, and excessive algae growth. Turbidity is reported in Nephelometric Turbidity Units (NTU) which is related to how easily light passes through the water sample.

### Results of annual stormwater monitoring under MS4 permit for turbidity (NTU) Town of Old Lyme



The Water Quality Standards have a criterion that indicates turbidity should not to exceed 5 NTU above ambient levels. In the draft MS4 permit, a turbidity result greater than 5 NTU over in-stream conditions will require a follow-up investigation. While there is not a fixed statewide criterion for turbidity, lower results are better for the health of the surface waters in town. Areas with higher levels of turbidity in stormwater would be a good place to develop additional stormwater controls.

## Town Maps

The following maps were created to show the impervious cover (IC) in your town as well as the water quality in the rivers, streams, lakes and estuaries in and around your town.

### *Impervious Cover on the Town Maps*

IC is shown in red on the maps. Dark red areas indicate a higher percentage of IC, lighter red areas have less IC, while the grey areas indicate very little or no IC.

### *Water Quality on the Town Maps*

Separate maps are provided for the different uses of the waterbodies such as Aquatic Life Uses, Recreation, and Shellfishing (in coastal towns). The waterbodies are colored to show the health of the waterbody. Green means that the waterbody meets the water quality requirements to fully support the specified use. Yellow means that water quality is poor and that the specified use is not met. Blue means that there is not enough information to know whether or not water quality is good or bad to support the specified use. Additionally, a small map is provided on the left side of each larger map to show which watersheds are within your town.

# Waters Designated For Aquatic Life in the Town of Old Lyme

Percent Impervious Cover	Designated For Aquatic Life
0-11%	Fully Supporting
12-25%	Not Supporting
26-50%	Unassessed
51-75%	
76-100%	

## Subregional Basins



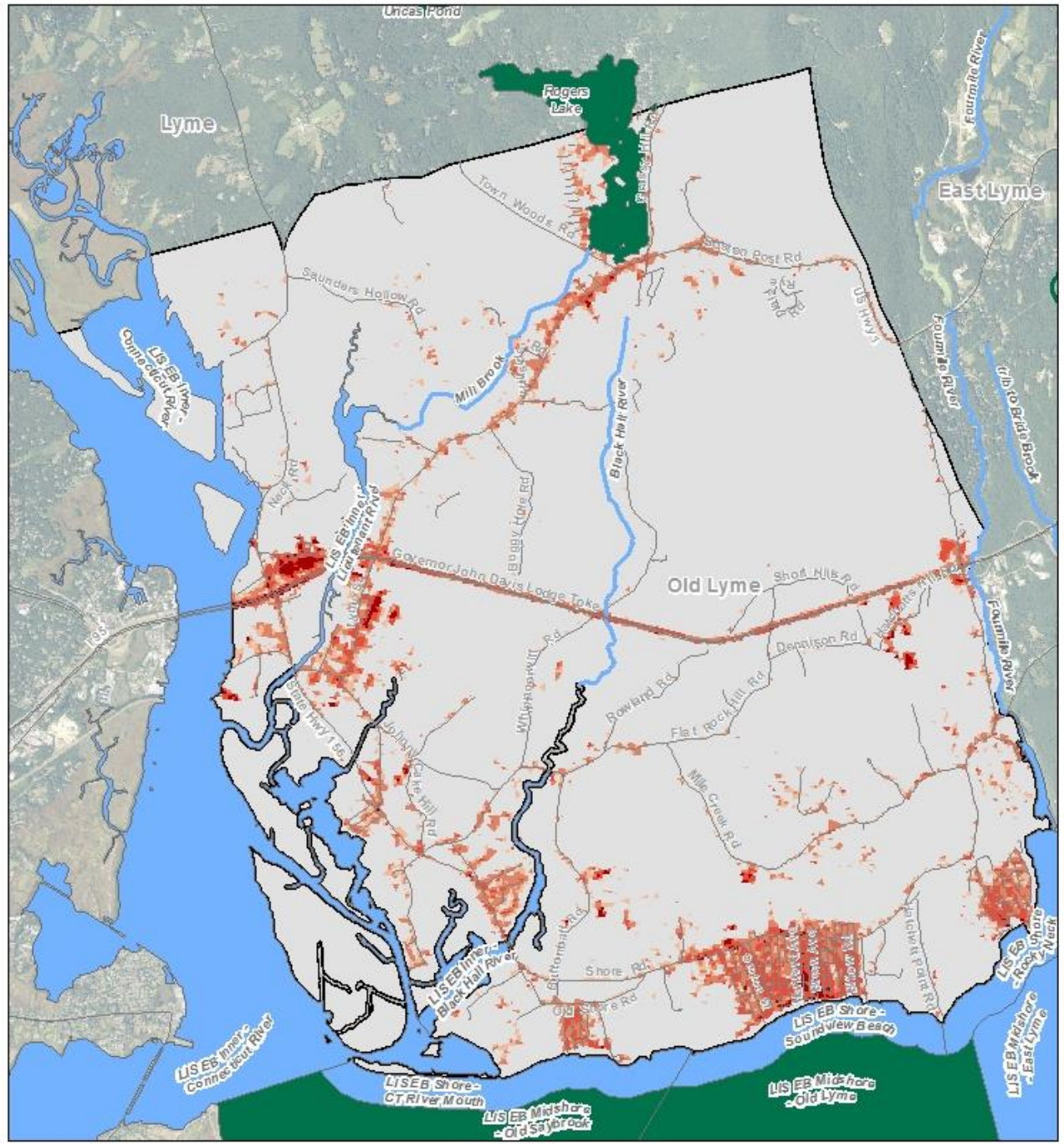
- Black Hall River
- Lieutenant River
- Connecticut River
- Southeast Shoreline
- Fourmile River



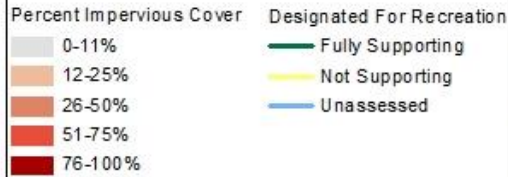
0 0.5 1 Miles

These maps were created using the National Land Cover Database (NLCD) 2011 Impervious Cover Percent Data. For more detail please review the metadata document.

Impervious cover (IC) refers to hard surfaces across the landscape such as pavement or buildings. These hard surfaces do not absorb water and prevent rain from soaking in to the ground. As a result, runoff occurs and easily carries pollutants to nearby lakes and streams.



## Waters Designated For Recreation in the Town of Old Lyme



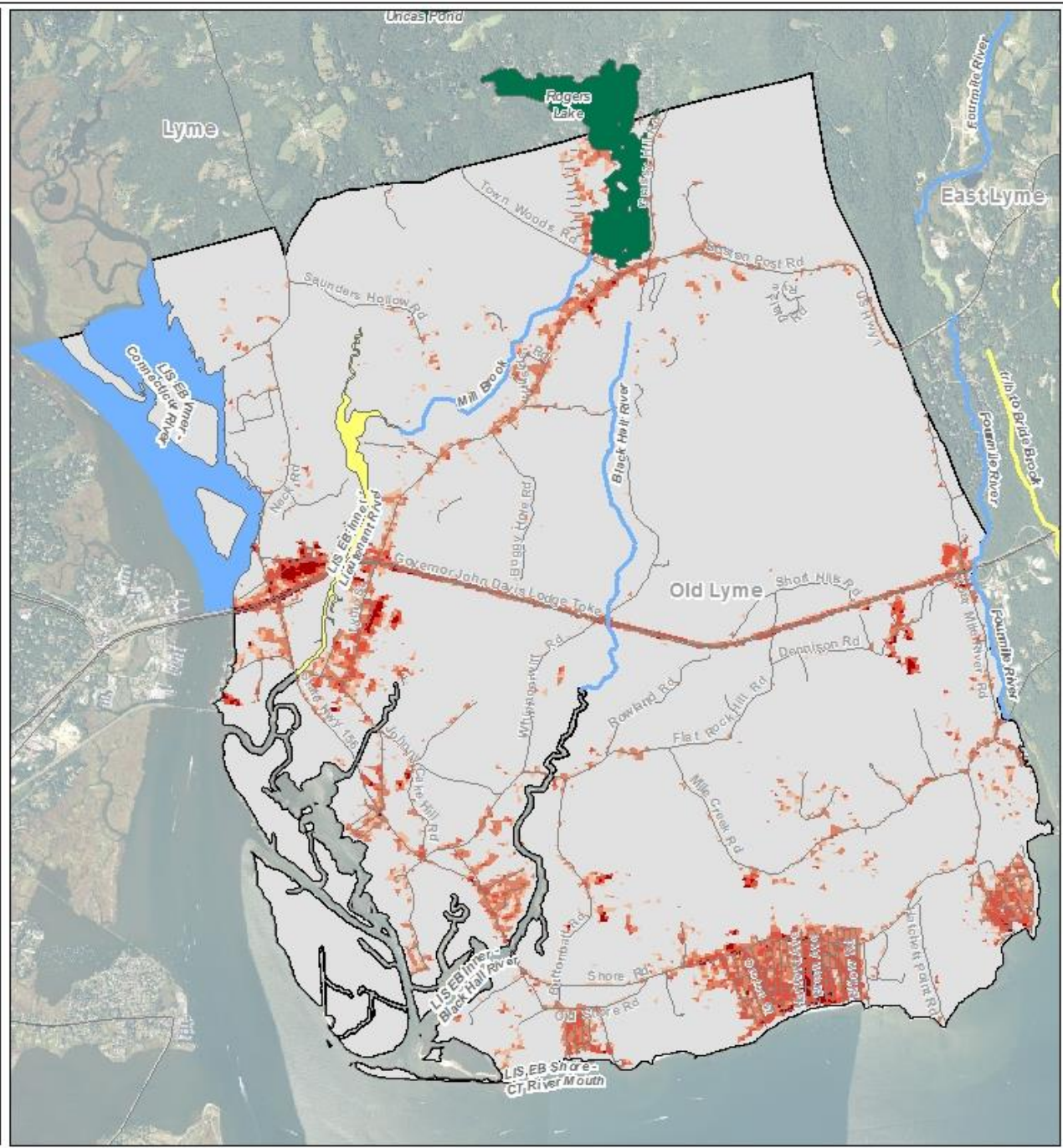
### Subregional Basins



0 0.5 1 Miles

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# Waters Designated For Shellfishing in the Town of Old Lyme

Percent Impervious Cover	Designated For Shellfishing
0-11%	Fully Supporting
12-25%	Not Supporting
26-50%	Unassessed
51-75%	
76-100%	

## Subregional Basins



- Black Hall River
- Lieutenant River
- Connecticut River
- Southeast Shoreline
- Fourmile River



0 0.5 1 Miles

These maps were created using the National Land Cover Database (NLCD) 2011 Impervious Cover Percent Data. For more detail please review the metadata document.

Impervious cover (IC) refers to hard surfaces across the landscape such as pavement or buildings. These hard surfaces do not absorb water and prevent rain from soaking in to the ground. As a result, runoff occurs and easily carries pollutants to nearby lakes and streams.

