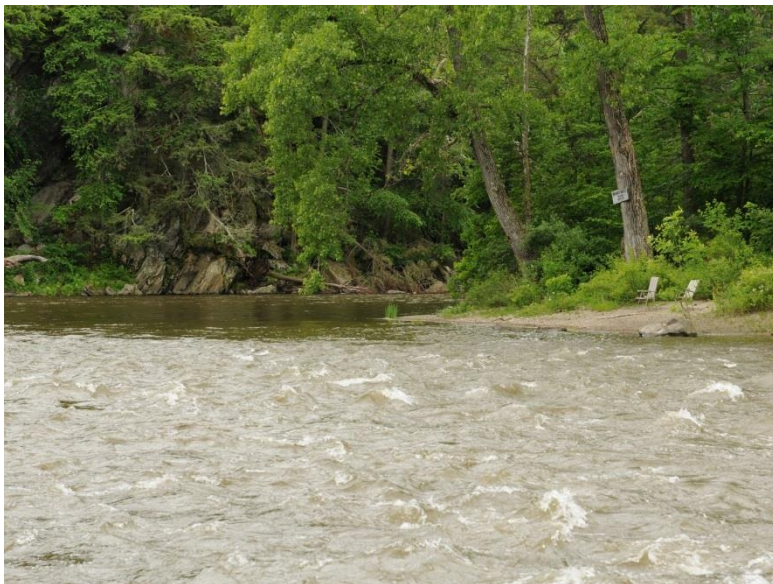


# 2016

## Integrated Water Resource Management in Connecticut



Connecticut Department of Energy and  
Environmental Protection, Bureau of Water  
Protection and Land Reuse,  
Planning & Standards Division  
5/17/2016

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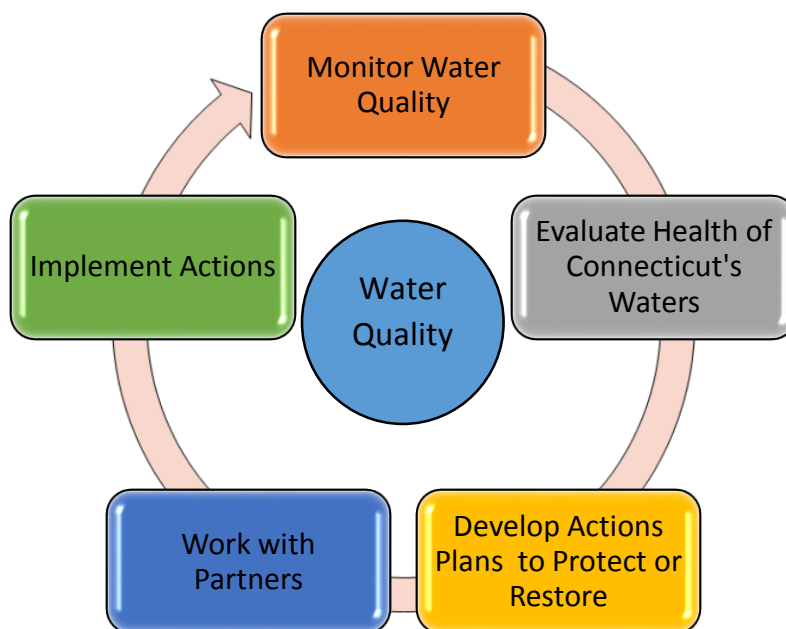
## Introduction

Taking action to restore and protect water quality.....that's the goal for Connecticut Department of Energy and Environmental Protection's current efforts to improve our approach to restoring and protecting Connecticut's water resources. Surface waters, such as rivers, streams, lakes, embayments and Long Island Sound, are important resources for residents, businesses and for fish and wildlife. Through Integrated Water Resource Management, we are looking to focus state resources and strengthen partnerships in Connecticut to better protect and restore our water quality.

## Protecting and Restoring Connecticut's Water Quality

In order to take care of our natural resources, the Connecticut Department of Energy and Environmental Protection (CT DEEP) monitors our waters. We focus on how our waters are used, such as for drinking water, fishing, swimming and for supporting healthy wildlife and fish, as well as the water quality needed to support these activities. We find some waters which are impaired and need some actions to bring back or restore good water quality. Other waters are healthy and have very good water quality, which needs to be maintained and protected. We establish plans and identify actions to achieve these restoration or protection goals and work with partners through voluntary and regulatory efforts to protect areas of good water quality and restore areas with impaired water quality.

Figure 1: Protecting & Restoring Water Quality

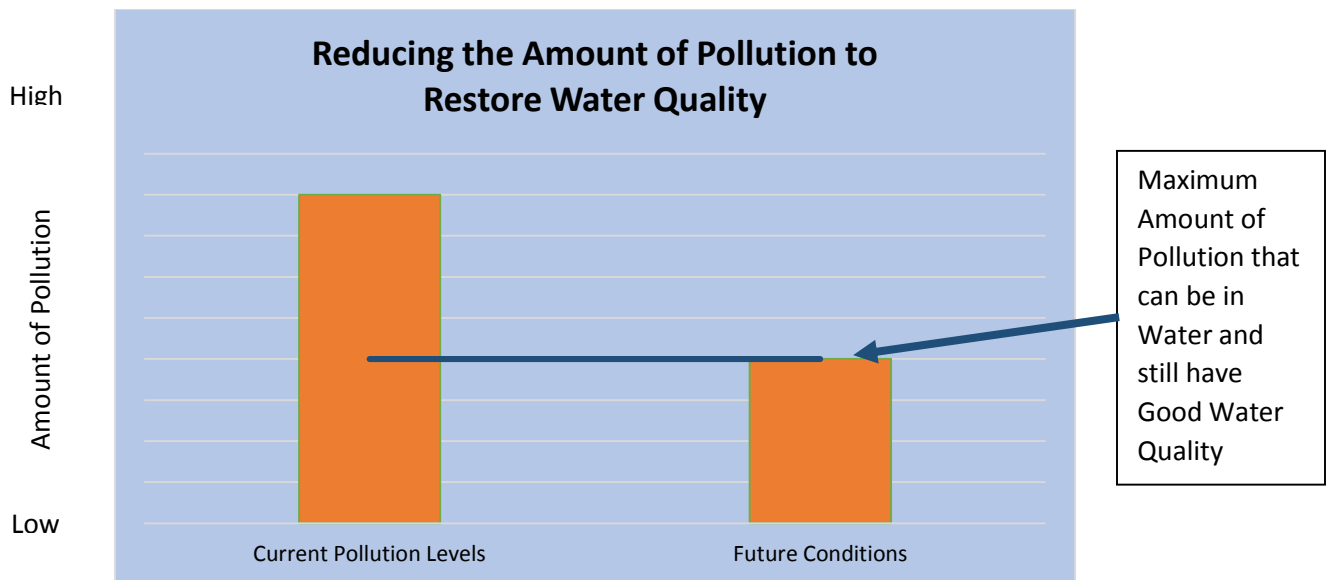


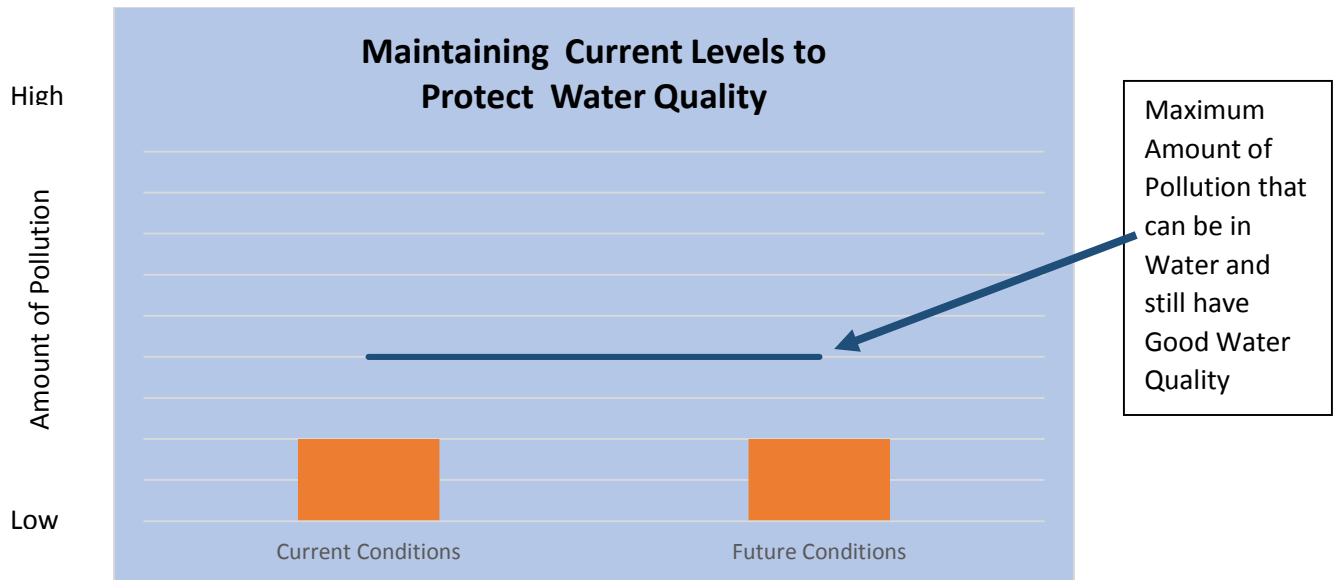
We are currently working to identify waters for development of action plans during the next 6 years (2016-2022). Over time, we may adjust the waters selected for plan development as new information and opportunities occur. With this report, we are identifying some potential places to start this effort, with input from the public.

## Background:

Under the federal Clean Water Act, States develop plans called **Total Maximum Daily Loads** (TMDLs) to restore waters with impaired water quality and protect waters with good water quality. A TMDL can be thought of as a water pollution budget or diet. Any waterbody with poor water quality is over its daily budget for a pollutant. These waterbodies are considered to be impaired by CT DEEP. The pollutant must be reduced to a lower level for the waterbody to be within its budget and water quality to be restored. Similarly, for waters with good water quality, setting a budget helps keep the amount of each pollutant at levels which protect existing water quality. The goal for all waterbodies is to have concentrations within their planned budgets.

Figure 2: Water Pollution Budgets: Total Maximum Daily Load Analysis





Developing these pollution budgets is not a new activity, but the United States Environmental Protection Agency (EPA) and the States are trying to take a new approach to this effort. EPA and the States looked at the past practices used to develop these plans and found some changes which could be made to improve this effort. EPA calls this updated approach to developing these plans the “Long-Term Vision for Assessment, Restoration and Protection under the Clean Water Act Section 303(d) Program” or the 303d Vision in short.

Figure 3: EPA 303(d) Vision Goal Statement

*The Clean Water Act Section 303(d) Program provides effective integration for implementation of activities to restore and protect the nation’s aquatic resources, where the nation’s waters have been assessed, restoration and protection objectives have been systematically prioritized, and Total Maximum Daily Loads and alternative approaches are being adaptively implemented to achieve water quality goals with the collaboration of States, federal agencies, tribes, stakeholders, and the public*

Connecticut has taken this updated approach and used it as the basis to enhance our efforts in restoring and protecting Connecticut’s waters through Integrated Water Resource Management. Through Integrated Water Resource Management we are trying to more effectively work towards restoring and protecting our waters by developing partnerships and looking for flexible and efficient approaches to linking our environmental data and goals with actions that support restoring or protecting our resources.

Figure 4: Integrated Water Resource Management

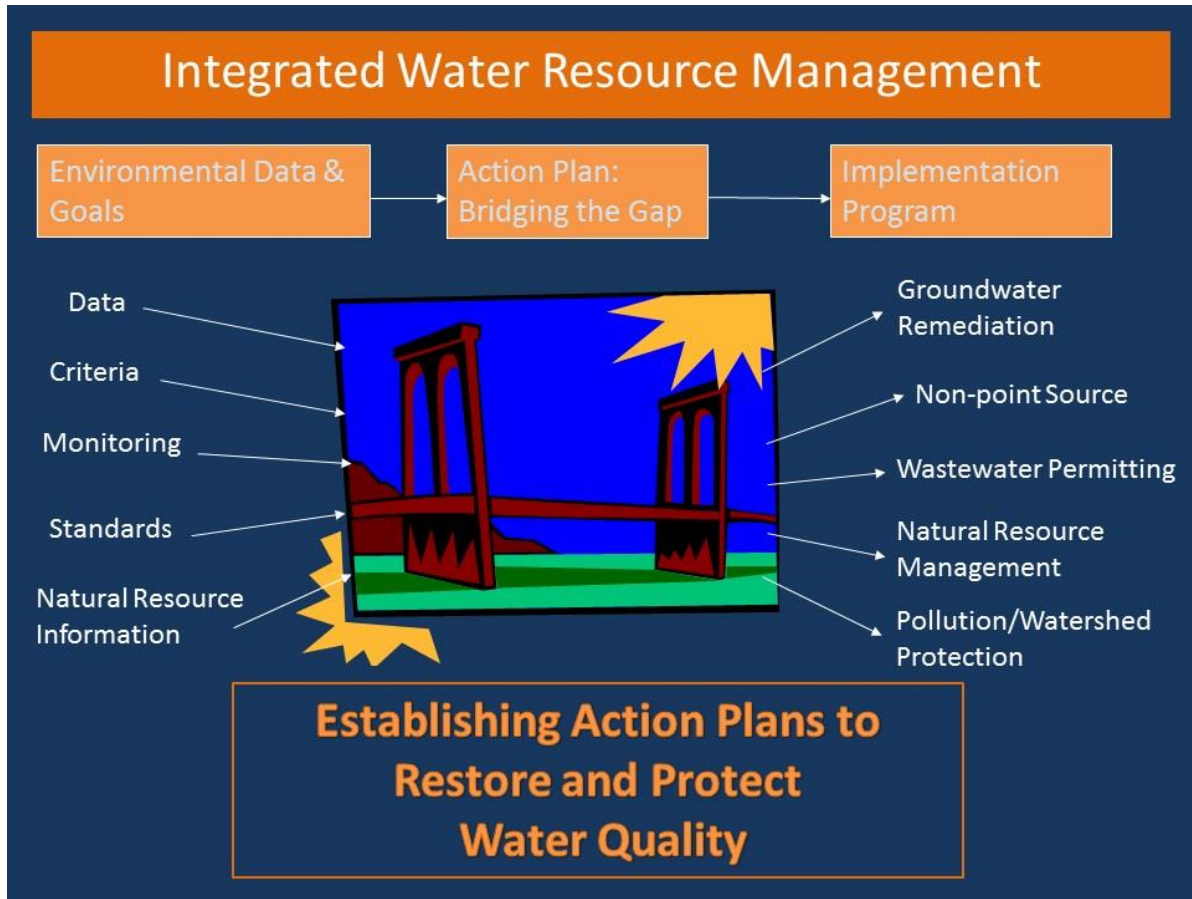
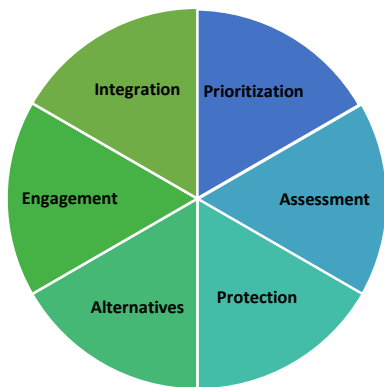


Figure 5: Key Elements of EPA Vision and Integrated Water Quality Management



The updated approach is based on six key elements which EPA identifies as: Prioritization, Assessment, Protection, Alternatives, Engagement and Integration. It allows states to identify areas for plan development based on state-specific concerns and provides sufficient time to develop plans using flexible approaches while creating no new regulatory requirements.

## Prioritization

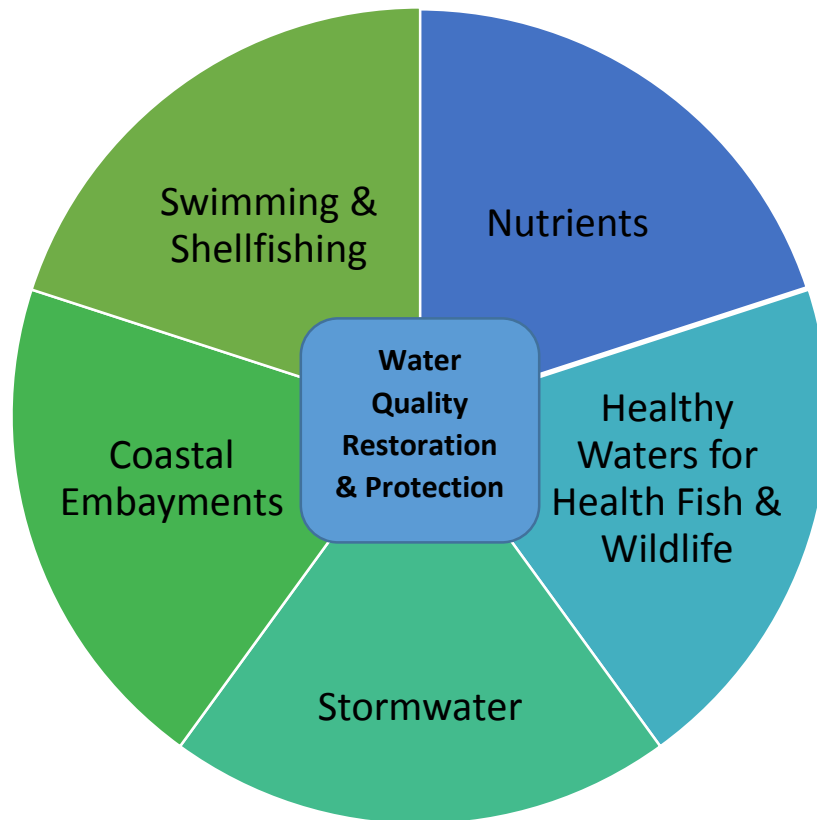
Figure 6: EPA Prioritization Goal

*“Prioritization” For the 2016 integrated reporting cycle and beyond, States review, systematically prioritize, and report watersheds or waters for restoration and protection in their biennial integrated reports to facilitate State strategic planning for achieving water quality goals*

States have been identifying waters for plan development for many years. However, with Integrated Water Resource Management, CTDEEP is taking a more proactive approach to identifying waters for plan development. Previously, EPA placed value on developing plans as quickly as possible. This approach has some benefits, such as focusing attention on areas where issues are more easily understood or addressed. However, sometimes more time is needed to address complex water quality concerns or to focus on issues which need a plan to address important statewide issues that might not be able to be done quickly. With this new effort, Connecticut has developed a new approach to identifying areas for plan development, systematically evaluating waters based on available ecological, social and pollution information while considering partnerships and the ability to realize restoration and protection goals.

CTDEEP identified aquatic resources and watershed conditions that have been previously listed as concerns which include:

Figure 7: Considerations for Plan Development



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Nutrients:

Nutrients such as nitrogen and phosphorus come from natural and manmade sources. Too much nutrients from manmade sources can lead to excessive growth of water plants and algae which then reduces the amount of oxygen available to living things in these waters. Sometimes algae blooms can contain toxic forms of algae which are harmful to people and animals that come into contact with it. Long Island Sound, coastal embayments and our rivers and streams are affected by nutrients and can impair recreation and aquatic life.



### Healthy waters for healthy fish and wildlife:

Good water quality provides support for healthy communities of fish that live in our rivers and streams and the wildlife that use these resources. Healthy aquatic communities are important for a healthy environment in Connecticut and also provide us with the opportunity to fish and enjoy our rivers and streams. Restoring and protecting these communities are important for both the health of Connecticut's environment and recreational and commercial fishing.

### Stormwater:

Hard surfaces across the landscape such as roads, sidewalks, parking lots and roofs force rain to flow across the land, carrying pollutants quickly and directly to rivers, lakes, and coastal waters instead of allowing the rain to soak into the ground and be filtered by the soil. This stormwater can carry pollutants to rivers and streams where they can affect fish and other aquatic life in the streams. The solids that stormwater carries can clog fish gills and smother fish eggs and suffocate the organisms that fish eat. Studies have shown that both the quality and flows of stormwater can harm rivers and streams.

### Coastal Embayments:

Connecticut's shore line and Long Island Sound are important resources for our state. While much is being done to improve the health of Long Island Sound, more work is needed both for the Sound and for the local embayments directly along our coastline.

### Swimming & Shellfishing:

High levels of bacteria in waters may cause illness to people coming in contact with it. For this reason, authorities may close beaches for swimming or may close shellfishing areas if high levels of bacteria are found. While many of our waters are affected by bacteria, we have developed action plans for most of these waters and will continue to do more.

CTDEEP undertook a systematic evaluation to identify potential areas to develop plans for water quality restoration and protection. A detailed description of this approach is provided in a separate document, [Technical Support Document: Identifying Watersheds for Restoration and Protection Plans with Connecticut Integrated Water Resource Management Efforts](#). Through this effort, CTDEEP has identified the areas for consideration of plan development. A list of these waters is provided in Appendix B. CTDEEP is asking the public to review and provide input on the areas for plan development. Additional information on this public comment opportunity is provided at the end of this report.

## Assessment

Figure 2: EPA Assessment Goal

*“Assessment” By 2020, States identify the extent of impaired and healthy waters in each State’s priority areas through site-specific assessments, which may be supplemented by on-going state-wide statistical surveys that have been initiated by 2014*

CTDEEP monitors and evaluates our waters to find out if our waters are clean or not and meeting Connecticut’s water quality goals. Water quality goals are identified in the Connecticut Water Quality Standards and are developed to protect common uses for waters such as fishing, swimming, drinking and providing healthy waters for fish and wildlife. CTDEEP routinely monitors waters across our state and our monitoring activities are important to support this Integrated Water Resource Management effort, providing some of the data needed to develop plans for restoration and protection.

### Initial Evaluation of Water Quality

Through on-going routine efforts, CTDEEP evaluates waters across Connecticut looking at the physical, chemical and biological quality of the water to see if the goals for the water are being met. Every two years, CTDEEP reports to EPA and the public on the health of Connecticut’s waters in a report called the Integrated Water Quality Report. Information from this regular evaluation shows which areas have healthy or impaired water quality and was used to help identify potential waters for plan development. A summary of the findings from the 2014 Integrated Water Quality Report are presented in Appendix A and the entire report is available on the CTDEEP website.

### Data to Support Plan Development

Often additional information is needed in order to put together water quality plans. Once a water is selected for development of a plan, a review will be done to see if more information is needed in order to develop the plan. Efforts will be made to get the necessary information either through CTDEEP efforts or by working with partners. Having enough of the right kind of information is important for development of a plan and actions to improve or protect our water resources. The ability and resources to get the needed information will be one of the key considerations when CTDEEP identifies waters for plan development.

## Checking on Success

After a plan has been developed and implementation actions begin, information will be needed from time to time to track actions and progress to restore or protect water quality.

## Protection

Figure 3: EPA Protection Goal

*“Protection” For the 2016 reporting cycle and beyond, in addition to the traditional TMDL development priorities and schedules for waters in need of restoration, States identify protection planning priorities and schedules for healthy waters, in a manner consistent with each State’s systematic prioritization*

Restoration looks at what is needed to improve waters where water quality is impaired, where our environment is not healthy or where we cannot enjoy our waters as we would like. Protection looks at finding ways to keep healthy environments and good water quality. Both restoration and protection actions are important for Connecticut’s waters and can be reflected in the plans we develop.

## Alternatives

Figure 4: EPA Alternatives Goal

*“Alternatives” By 2018, States use alternative approaches, in addition to TMDLs, that incorporate adaptive management and are tailored to specific circumstances where such approaches are better suited to implement priority watershed or water actions that achieve the water quality goals of each state, including identifying and reducing nonpoint sources of pollution*

Use the right tool for the right job. Sometimes a large and complex plan is needed to address the water quality concerns, other times, solutions to issues can be very straight forward and not need a great deal of study in order to know what needs to be done. States, with support from EPA, are encouraged to consider the best type of plans to make in order to protect or restore waters. States can develop traditional TMDL plans or use other innovative approaches. As traditional or innovative approaches to plan development are selected, there will be a need to check on progress from time to time to make sure that we are being effective.

CTDEEP has typically developed traditional TMDL plans to address impaired water quality for specific waters. Some TMDLs were developed to address issues which affect wide spread areas within our state. These TMDLs include the Long Island TMDL to address the impacts of nutrients on the oxygen levels within Long Island Sound, the Regional Mercury TMDL which was done in conjunction with other New England states and New York to address elevated levels of mercury in fish tissue, and the Connecticut Statewide Bacteria TMDL to address the impacts of elevated levels of bacteria on recreational and shellfishing activities within Connecticut.

There are times, though, when Connecticut has used alternative approaches to protecting and restoring water quality. Examples of alternative approaches which have been or may be used in Connecticut include:

- Water Quality Based Permitting: TMDL staff work with permitting staff to develop permit limits and requirements which are protective of water quality, even if a TMDL has not been developed for the water. This provides an initial level of protection for water quality and consistency with Connecticut's Water Quality Standards.
- Watershed Response Plan for Impervious Cover: This document addresses the impacts of stormwater on the health of rivers and streams in Connecticut. The relationship between hard surfaces within the landscape (called impervious cover) and water quality is discussed and recommended approaches to minimizing water quality impacts from stormwater are provided. The document provides general information which is applicable statewide as well as detailed analyses of 20 urban watersheds which are affected by stormwater. Also as part of this effort, CTDEEP made a web page to discuss Stormwater and Water Quality. This web page provides general information on the potential for stormwater to impact water quality and provides links to the Watershed Response Plans for Impervious Cover as well as fact sheets for each town which discusses water quality concerns and stormwater quality for each town to help towns and other permittees reduce the impacts from stormwater.
- Remediation Activities: TMDL staff work with CTDEEP Remediation Division staff to develop remediation goals and requirements so that when a clean-up is completed, Connecticut water quality goals would be expected to be met. One example of this is the cleanup of the Mill River in Fairfield. The sediments in the river were contaminated by lead from a former industrial facility. Instead of developing a TMDL for this river, TMDL staff worked with staff in the Remediation Division to have contaminated sediments removed and the river habitat restored based on water quality goals.

Another example is a cleanup of contaminated sediments on the Quinnipiac River. CT Department of Public Health established a fish consumption advisory for the Quinnipiac River south of the Gorge to Hanover Pond. However there is no longer need to issue a consumption advisory for fish caught in the Quinnipiac River north of the

Gorge in Meriden, because new sampling data from the river indicates Polychlorinated Biphenyl (PCB) levels in fish have decreased greatly over the past decade. The fish advisory was needed because in 1996 buried drums containing PCBs were found along the Quinnipiac River in Southington. Emergency response teams from both the Connecticut Department of Energy and Environmental Protection (DEEP) and the United States Environmental Protection Agency responded to the discovery and identified that high levels of contamination were also present in river sediments and in some fish. DEEP conducted an extensive cleanup of the river, removing the drums and the contaminated sediments. The lower PCB levels in fish are the result of these cleanup efforts.

- Watershed Based Plan: Watershed based plans focus on addressing pollution from nonpoint sources, such as runoff from the land from landuse activities which aren't covered under regulatory programs. Watershed Based Plans are developed to identify and understand sources of nonpoint pollution which can affect waters and then determine what actions are needed to restore or protect water quality. Watershed Based Plans can be a good alternative to traditional plans (TMDLs). For example, in 2004, North Running Brook in Northeastern Connecticut was identified as having impaired water quality. A Watershed Based Plan, [The Muddy Brook and Little River Water Quality Improvement Plan](#), was done in 2009 which identified the need to control runoff from a nearby farm to restore water quality in North Running Brook. Using the Watershed Based Plan, a team of partners came together to fix the issues causing the impaired water quality. In 2012 the stream met its water quality goals as a result of that work. A summary of this project is included in Appendix C of this document.

As we develop new plans to restore and protect water quality through the Integrated Water Resource Management effort, CTDEEP expects to use traditional approaches (TMDLs) and alternative approaches.

## Engagement

Figure 5: EPA Engagement Goal

*“Engagement” By 2014, EPA and the States actively engage the public and other stakeholders to improve and protect water quality, as demonstrated by documented, inclusive, transparent, and consistent communication; requesting and sharing feedback on proposed approaches; and enhanced understanding of program objectives*

Protecting and restoring water in Connecticut depends on building partnerships....and successful partnerships depend on communicating with and involving people and organizations interested in or affected by what is happening within our waters and watersheds. Through the Integrated Water Resource Management Process CTDEEP seeks to improve communication and outreach to strengthen existing partnerships and work with new partners.

CTDEEP will use multiple means to communicate with people, including:

CT DEEP Web Site: Information on Integrated Water Resource Management will be provided on the CTDEEP web site.

Email Notification: CTDEEP offers a Water Quality Planning Listserv for people to sign up to receive email notification of activities related to water quality programs at CTDEEP. This email notification service will be used to send notices about Integrated Water Resource Management activities to those who sign up for this service.

Meetings: Meeting will be scheduled as part of the Integrated Water Resource Management activities. Some of these meetings may be public meetings. Staff will also look for opportunities to present information on Integrated Water Resource Management at conferences or meetings scheduled by other groups. Additionally, staff will be available to participate in meetings at the request of other organizations or agencies.

Public Comment Opportunities: Opportunities for public comment will be provided throughout the Integrated Water Resource Management process. Typically, public comment will be solicited when CTDEEP is identifying waters for which to develop plans for restoration or protection. Additionally, once a plan is drafted there will be an opportunity to comment on the plan before it is finalized.

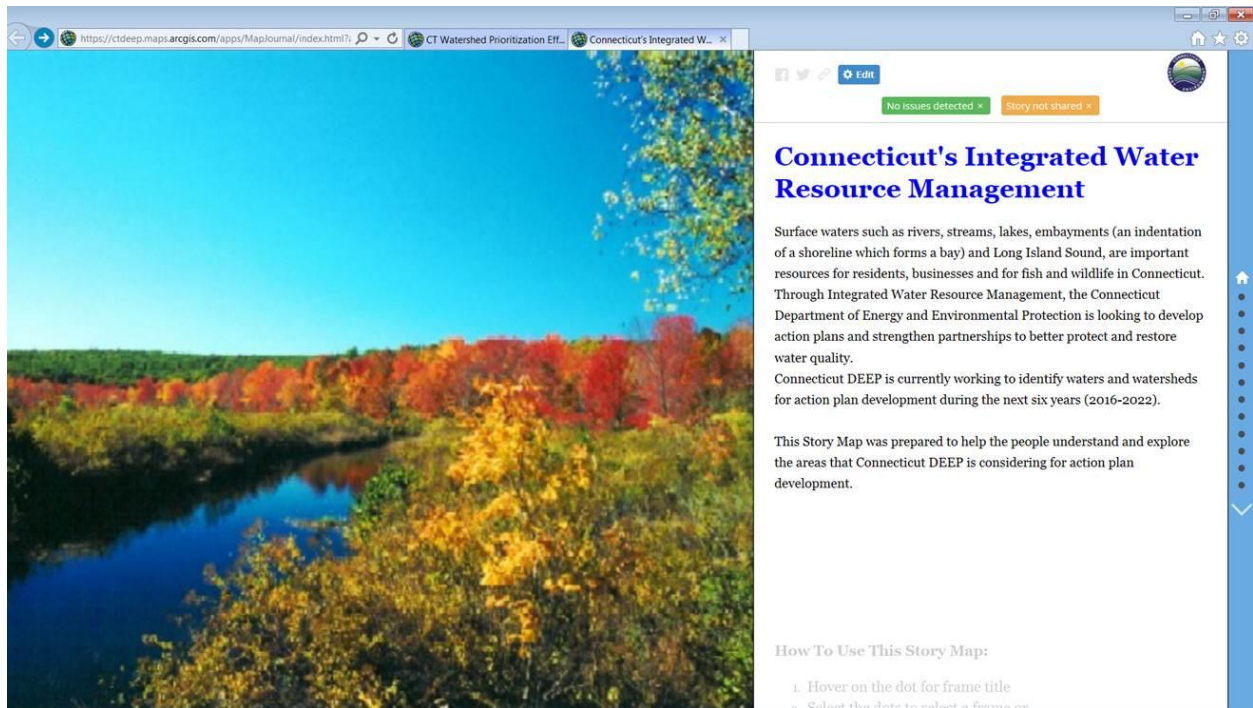
Innovative Approaches: CTDEEP will look for new and innovative approaches to improve communication. Currently we are beginning to use interactive online mapping tools to design new ways to share information with the public. For Integrated Water Resource Management we have developed an interactive online map to help people review and explore the areas currently recommended for plan development as part of the public comment opportunity detailed below. Another example of interactive maps developed to address water quality issues is the online map for [Stormwater Pollution Management in Connecticut](#).

## Public Comment Period

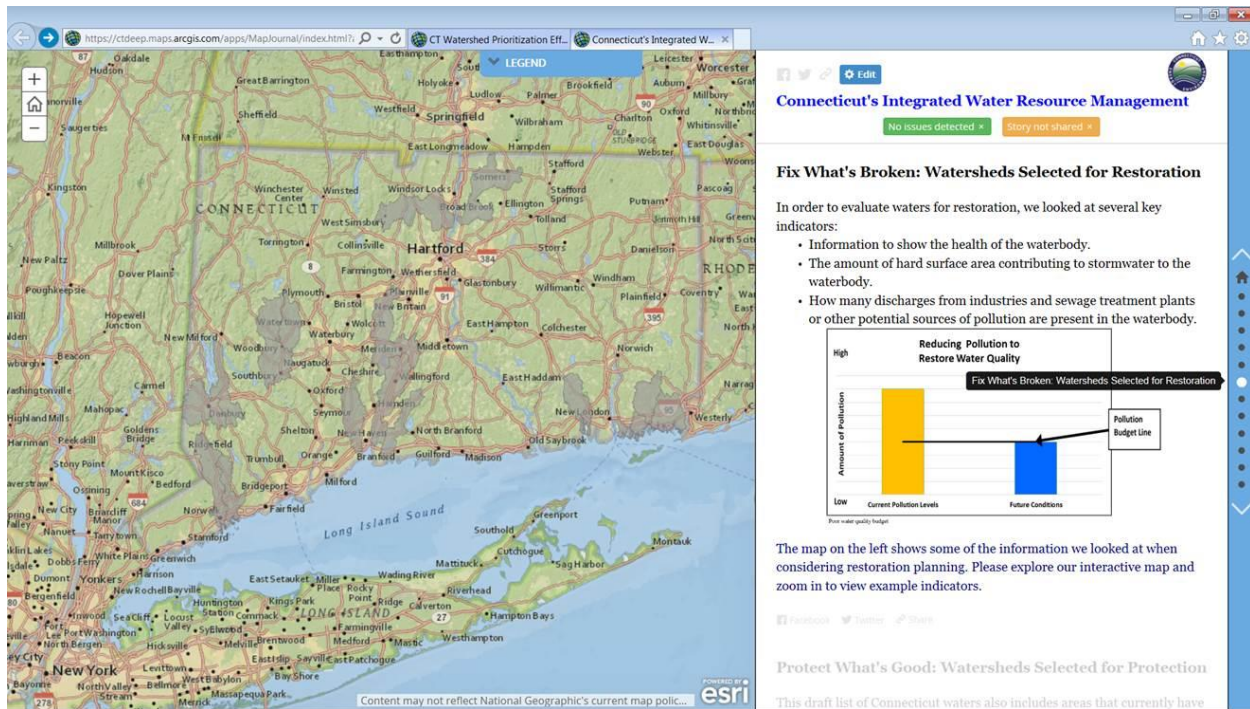
This initial listing of potential waters for plan development is being offered for public review and comment. We would like to hear from you. We are particularly interested in working with partners to achieve restoration and protection goals for Connecticut's water resources.

CTDEEP has developed an online interactive Story Map to help you understand which waters are being considered for plan development and why. This Story Map gives you the opportunity to explore these areas and others so you can provide us with your opinions.

Figure 12: Story Map







Public comments will be collected from **May 27, 2016, through June 30, 2016**. Two public meetings will be held on **June 20<sup>th</sup>**. The first session will be held at **CT DEEP HQ, 79 Elm ST, Hartford, CT** in the **Gina McCarthy Auditorium** from **1:30 to 3:30 p.m.** A second session will be held at **Goodwin College, One Riverside Drive, East Hartford, CT 06118** in the **Auditorium** from **6:00 to 8:00 in the evening**. These events will feature a presentation on the Integrated Water Resource Management process and identification of potential waters for development of water quality action plans. People are invited to attend and ask questions.

Any comments on the potential areas for plan development should be provided in writing either through the mail or email on by **June 30, 2016**. Email comments should be submitted to: [christopher.sullivan@ct.gov](mailto:christopher.sullivan@ct.gov). Written comments may also be submitted to CTDEEP WPLR 79 Elm Street. Hartford CT 06106 Attn: Mr. Christopher Sullivan

A website has been set up to provide information and documents for the public to review. The Story Map can also be found as a link on this web page.



## Integration

Figure 13: EPA Integration Goal

*“Integration” By 2016, EPA and the States identify and coordinate implementation of key point source and nonpoint source control actions that foster effective integration across CWA programs, other statutory programs (e.g., CERCLA, RCRA, SDWA, CAA), and the water quality efforts of other Federal departments and agencies (e.g., Agriculture, Interior, Commerce) to achieve the water quality goals of each state*

As part of Integrated Water Resource Management, CTDEEP has been working to improve coordination within and outside of our Agency. We have held meetings, inviting members from the different regulatory and environmental resource programs in CTDEEP to learn about and participate in Integrated Water Resource Management. As part of initial efforts to identify potential areas for plan development, we sought data and participation from these various programs to help in identifying an initial group of focus areas for plan development. This included with the CTDEEP Watershed Managers who work on nonpoint source pollution, members of regulatory programs such as site clean-up programs and permitting programs, staff involved in resource protection such as fisheries managers as well as staff from our state parks programs. We have begun the integration with other agencies in Connecticut and will continue to work to broaden the integration throughout Connecticut, seeking partners involved in resource protection and implementation activities.

## Become Involved!

CTDEEP would like the public to weigh in on the waters which we have identified as candidates for developing plans for protection or restoration of water quality. This was done through a detailed process relying on environmental data and input from regulatory and conservation programs across the agency and areas of interest for environmental quality in Connecticut.

In order to evaluate waters for plan development, we looked at various information and many factors affecting water quality and use, including:

- Health of the waterbody, such as: Do we have information to show the waters are healthy or not?

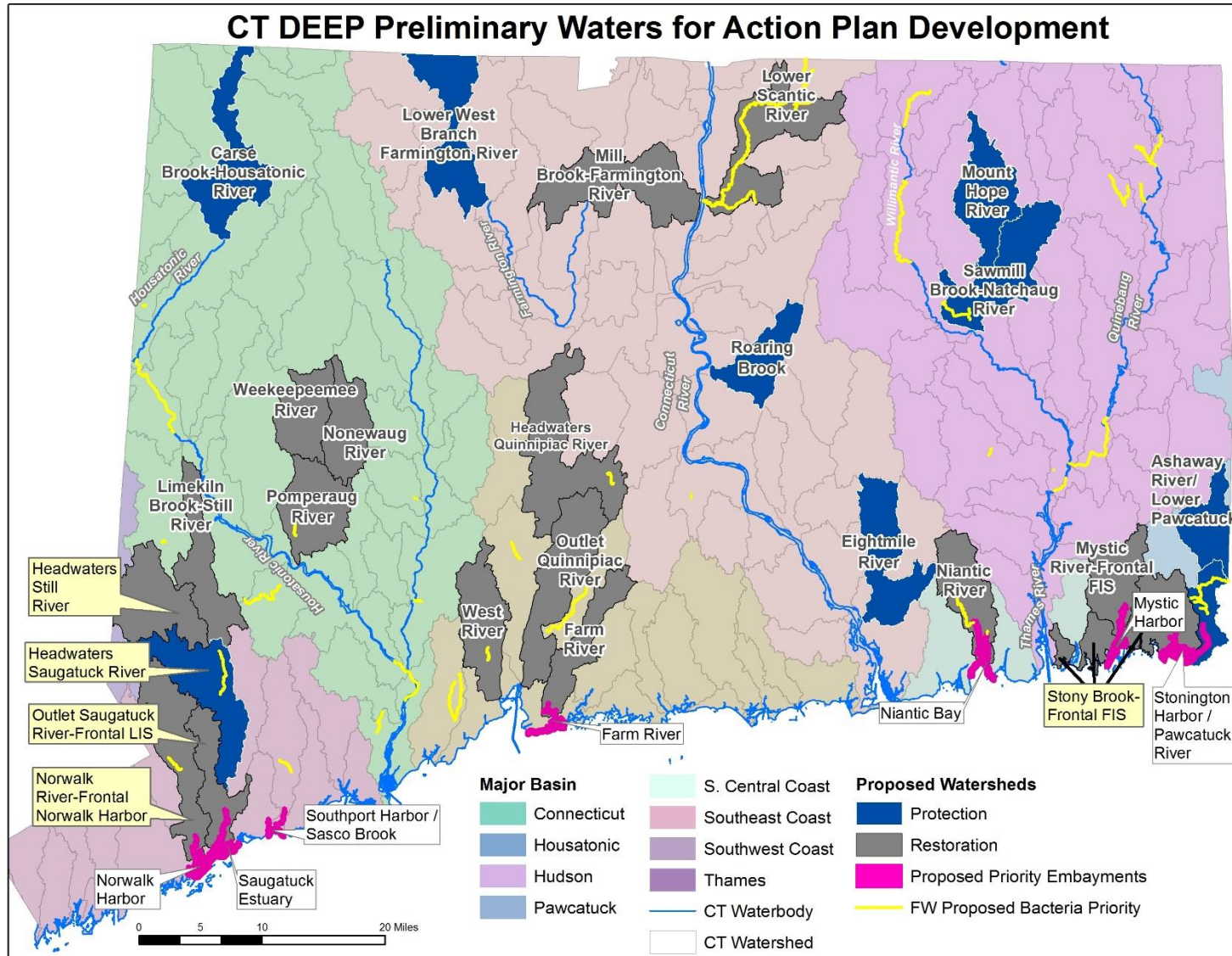
- Potential for pollution to affect the water, including: How much hard surfaces contribute stormwater? How many discharges from industries and sewage treatment plants or other potential sources of environmental contamination could be present?
- Potential partnerships to help restore water quality.

A detailed discussion of the process which we used to identify potential waters for plan development is presented in a separate document called Technical Support Document: Identifying Watershed for Restoration and Protection Plans with Connecticut Integrated Water Resource Management Efforts.

The initial set of waters which CTDEEP is considering for plan development are identified in Figure 14 below. A detailed listing of these waters is also included in Appendix B. While many waters could benefit from developing a plan, this initial list of waters represent areas where we may develop action plans over the next few years. This list of waters may be refined based on comments received from the public and on CTDEEP resources available to develop these plans. Over time, additional waters will be identified for development of water quality restoration and protection plans.

In addition to the waters identified in Figure 13, the impact of stormwater on water quality is also a concern for water quality. The potential for stormwater to impact water quality was taken into consideration in selecting waters for action plan development. Additionally, CTDEEP intends to address the impacts from stormwater by working collaboratively with between water quality and permitting programs to make sure that stormwater permits and regulatory requirements are responsive to the water quality concerns in Connecticut. As such, development of a separate plan to address stormwater is not being proposed at this time. It is possible that stormwater will be included in the plans developed for the selected watersheds, but inclusion of stormwater will be on a case by case basis.

Figure 6: Potential Areas for Plan Development



## Appendix A: Summary Information from the 2014 Integrated Water Quality Report



**CONNECTICUT DEPARTMENT OF ENERGY AND  
ENVIRONMENTAL PROTECTION**

79 Elm Street, Hartford, CT 06106-5127

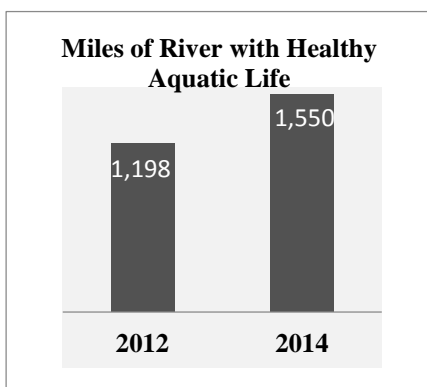
<http://www.ct.gov/deep/iwqr>

2014 INTEGRATED WATER QUALITY REPORT

The Connecticut Integrated Water Quality Report (IWQR) was prepared by the Department of Energy and Environmental Protection (CT DEEP) pursuant to Sections 305(b) and 303(d) of the federal Clean Water Act (CWA). Section 305(b) requires each State to monitor, assess and report on the quality of its waters every two years. Water quality is assessed in terms of designated uses established by the Connecticut Water Quality Standards (WQS) that include aquatic life support, fish consumption, recreation, and shellfish harvesting. Monitoring and assessment data indicate the attainment of designated uses when consistent with appropriate WQS. If data are not consistent, the waterbody is identified as impaired for a particular designated use. Section 303(d) requires each State to compile an Impaired Waters List identifying those waters not meeting WQS and to assign a priority for each impaired waterbody for development of Total Maximum Daily Load (TMDL) analysis or other management action. The Impaired Waters List includes any waterbodies that are not supporting one or more designated uses. The IWQR is submitted to the United States Environmental Protection Agency (EPA) for review and approval of the Impaired Waters List.


Water Quality Monitoring

There are 5,830 river miles and 64,973 acres of lakes in the State, of which 2,838.12 river miles (990 assessment segments) and 30,437.46 acres of lakes (182 assessed segments) have been tracked for designated uses. Along the coast, there are 611.89 square miles of estuarine waters (210 assessed segments) in the State which have been tracked for designated uses. The number of estuarine and lake assessed segments remains unchanged in this report cycle while 118 assessed segments of rivers (298.98 miles) were added.




In the 2012 IWQR, 1,198 miles of assessed river met chemical and biological criteria to fully support aquatic life use. In this 2014 IWQR 1,550 miles of assessed river meet chemical and biological criteria to fully support aquatic life use, showing an increase of 352 miles of healthy waters assessed in Connecticut.

Designated Uses


The *Aquatic Life Use* (i.e. Habitat for Fish and  Aquatic Life) assessment is supported when habitat and water quality are suitable for maintaining a native, naturally diverse community of aquatic plants and animals.

<i>Aquatic Life Use</i>	Fully Supporting	Not Supporting	Not Assessed	Insufficient Information
Rivers (Miles)	1549.54	435.94	552.91	299.73
Lakes (Acres)	26523.93	1158.90	2754.63	0
Estuaries (SQ. Miles)	237.22	314.46	59.13	1.08

 The *Fish Consumption Use* assessment is determined by consumption advisories issued by the Connecticut Department of Public Health (CT DPH) and published in the CT DEEP Angler's Guide. Unless a site-specific advisory has been issued, the designated use is considered supported. Advisories may be issued for a site-specific concern or to address large areas of impact. There are statewide fish advisories for all freshwaters due to mercury contamination and for all estuarine waters due to Polychlorinated Biphenyl (PCB) contamination.


\*Refer to CT DEEP Angler's Guide for more information about fish consumption advisories, online at [www.ct.gov/deep](http://www.ct.gov/deep)

<i>Fish Consumption Use*</i>	Fully Supporting	Not Supporting	Not Assessed
Rivers (Miles)	2705.97	130.21	1.94
Lakes (Acres)	26797.08	3639.01	1.37
Estuaries (SQ. Miles)	603.26	8.63	0

The *Recreation Use* is supported when indicator  bacteria concentrations are below the thresholds in the CALM for any water-related activity during which there is contact with the water and/or there exists a risk of water ingestion.

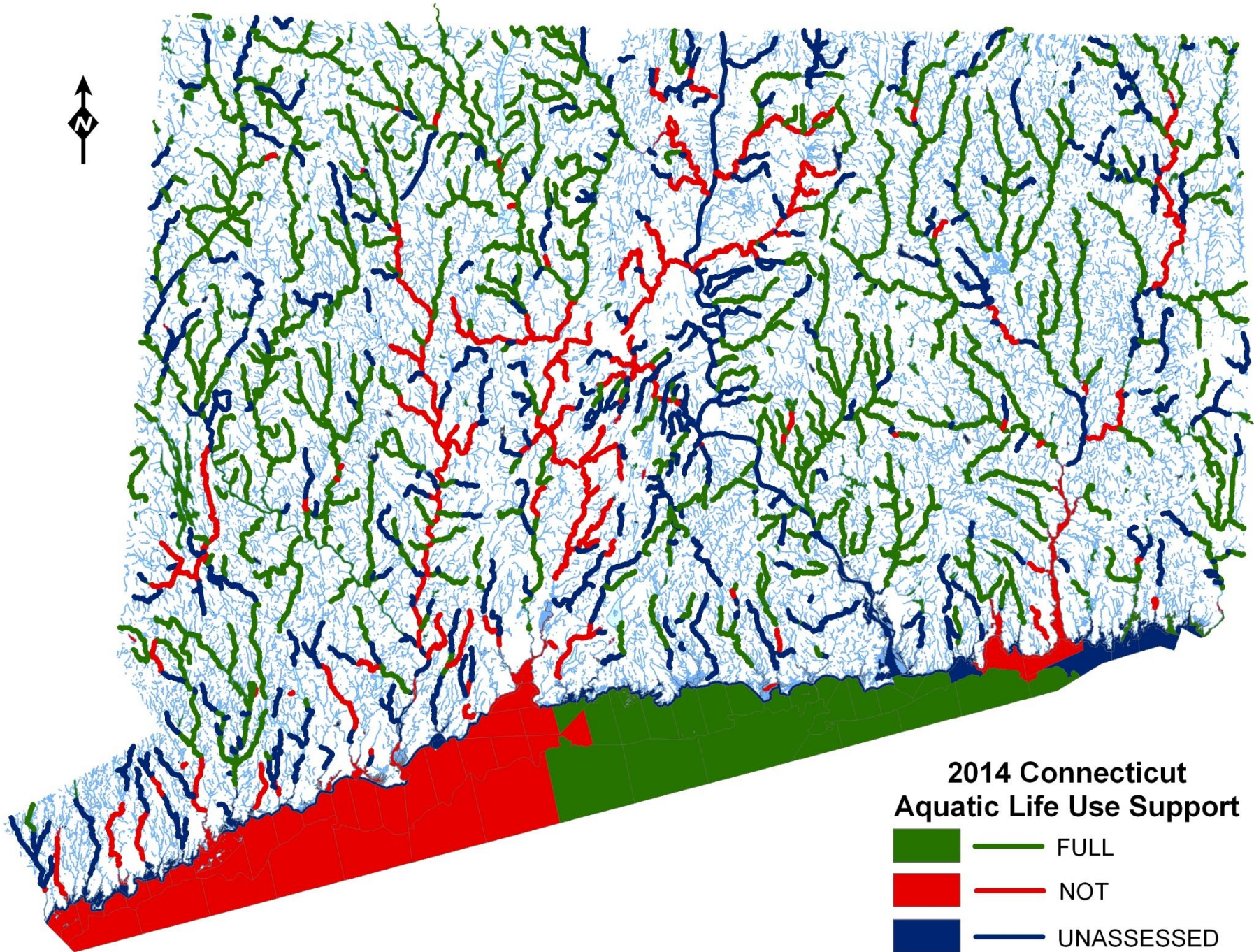
<i>Recreation Use</i>	Fully Supporting	Not Supporting	Not Assessed	Insufficient Information
Rivers (Miles)	357.47	826.75	1570.07	83.83
Lakes (Acres)	18897.39	4442.11	7097.96	0
Estuaries (SQ. Miles)	28.89	13.11	569.89	0

<i>Shellfish Harvesting Use</i>	Fully Supporting	Not Supporting	Not Assessed
Class SA Estuaries (Miles)	39.19	206.62	0.58
Class SB Estuaries (Miles)	38.69	20.43	5.99

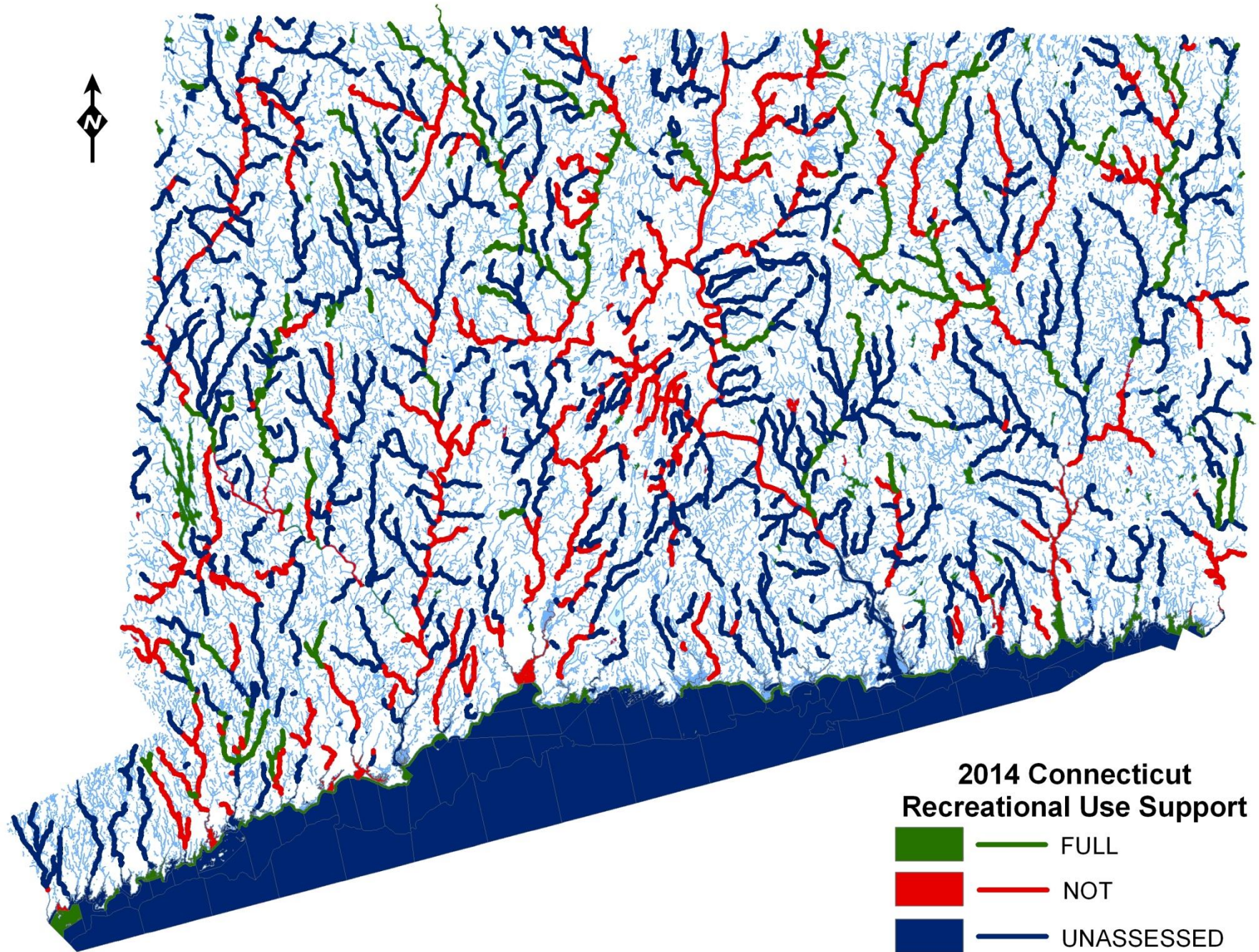
The *Shellfish Harvesting Use* is supported when  shellfish harvested from Approved Shellfish Areas (Class SA) are safe for consumption without depuration and shellfish harvested from approved Restricted Shellfish Areas (Class SB) are safe for consumption with depuration. The Department of Agriculture Bureau of Aquaculture classifies and evaluates shellfishing areas

in the State.

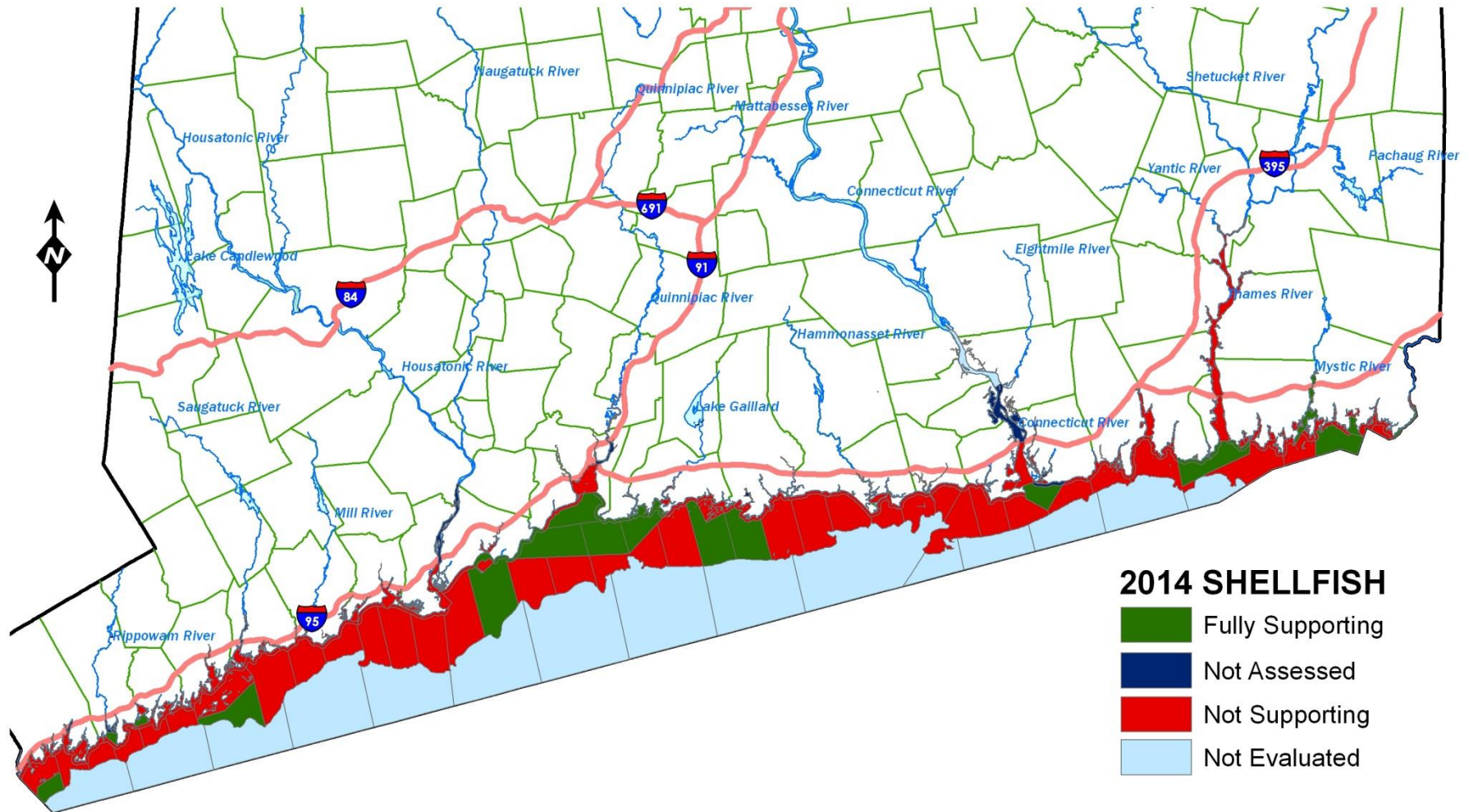












Impaired Waters

Based on the designated use assessments, a total of 546 assessed segments do not support one or more designated uses. These assessed segments appear on both the Connecticut’s Impaired Waters List (EPA Category 5) and those included within EPA Category 4 where a pollution control or management measure has been developed for the impairment.

<i>Impaired EPA Category</i>	4a = TMDL Established	4b = Other pollution control requirements to be implemented	4c = Reduce nonpollutant impacts through management measures	5 = TMDL is Needed
Assessed Segments within each Category	253	13	66	285

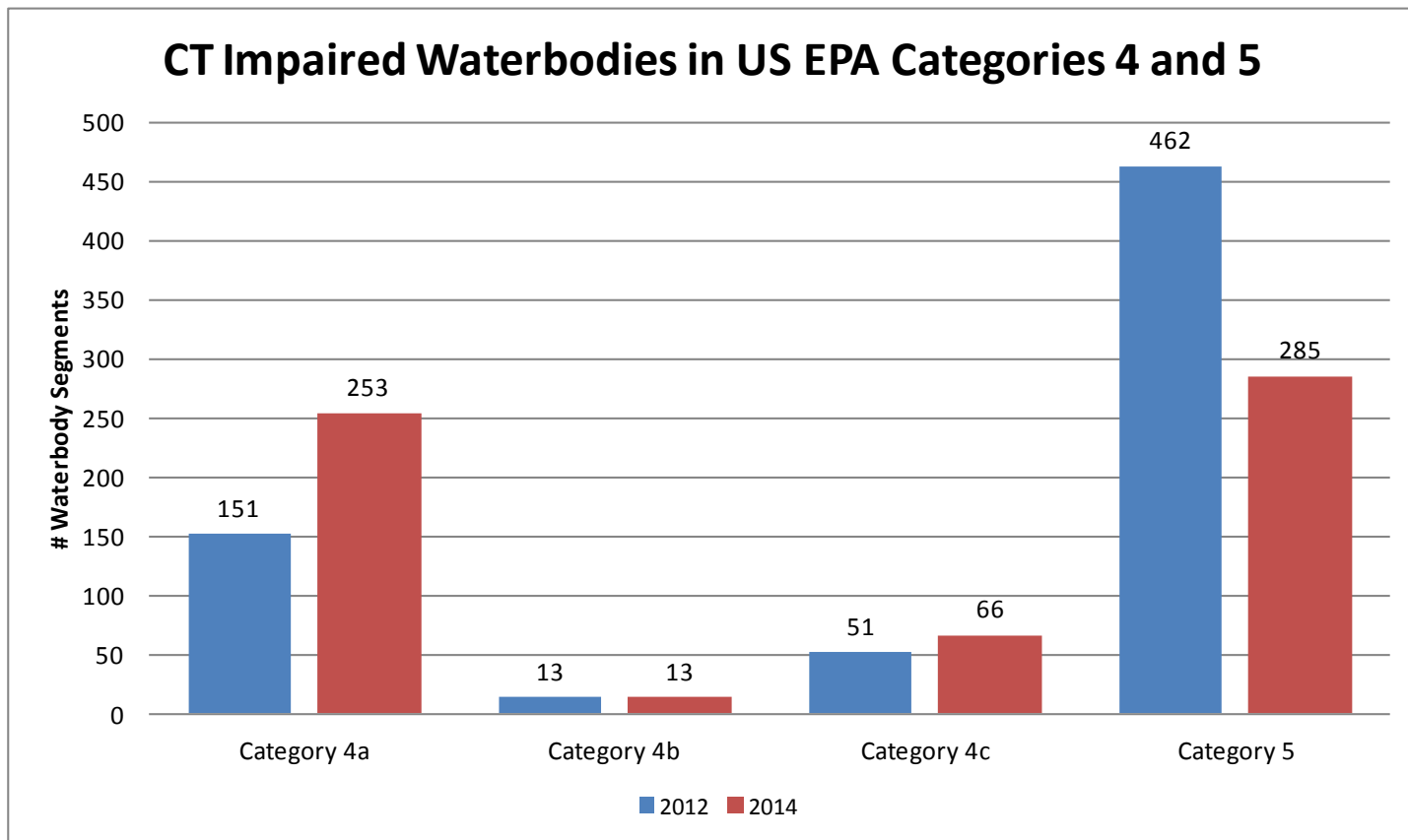
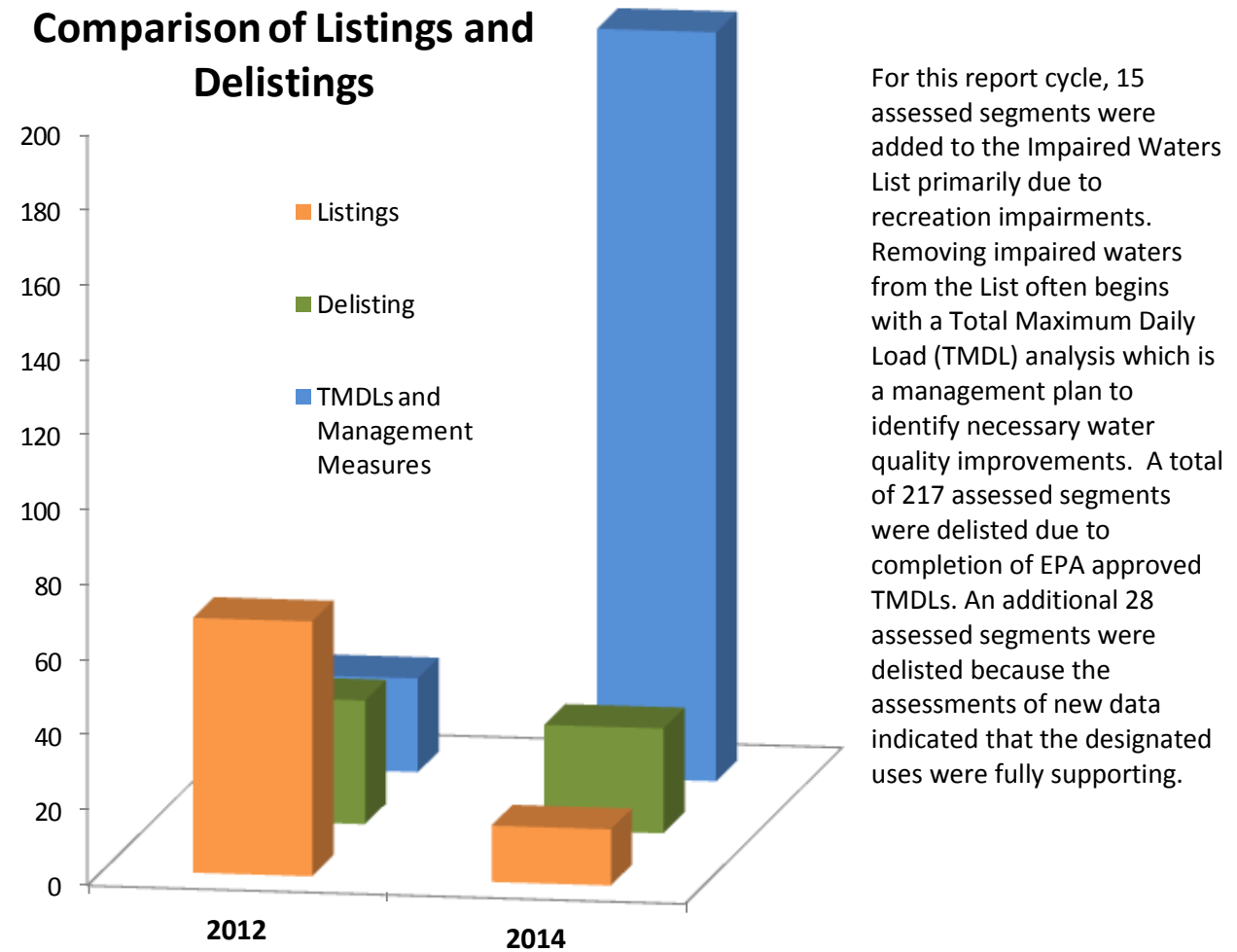


Figure: Summary of 2012 and 2014 Impaired Waterbody Segments in US EPA Category 4 and 5



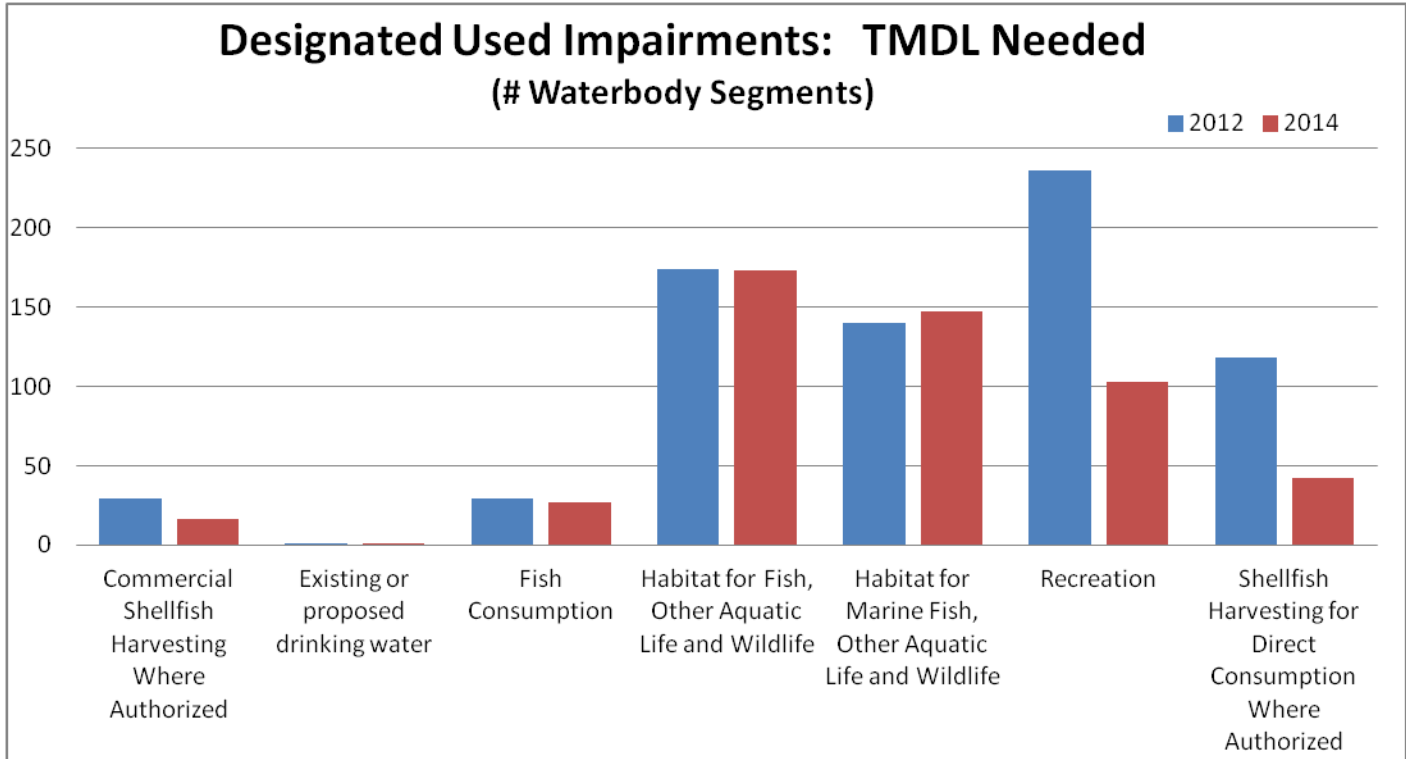


Figure: Summary of 2012 and 2014 Impaired Segments by designated use for Category 5 Waterbodies.

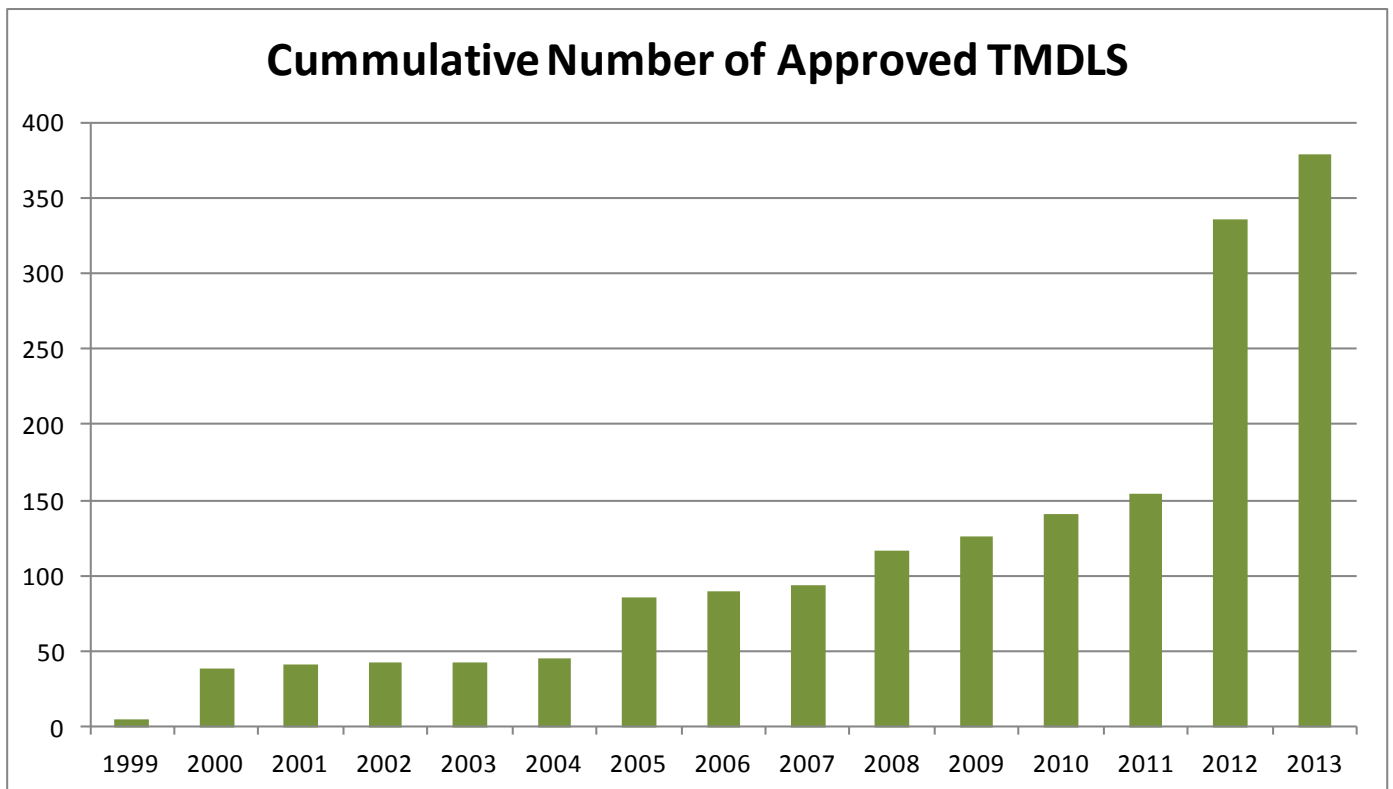


Figure: The total number of TMDLs in CT that have been developed by DEEP and approved by EPA.

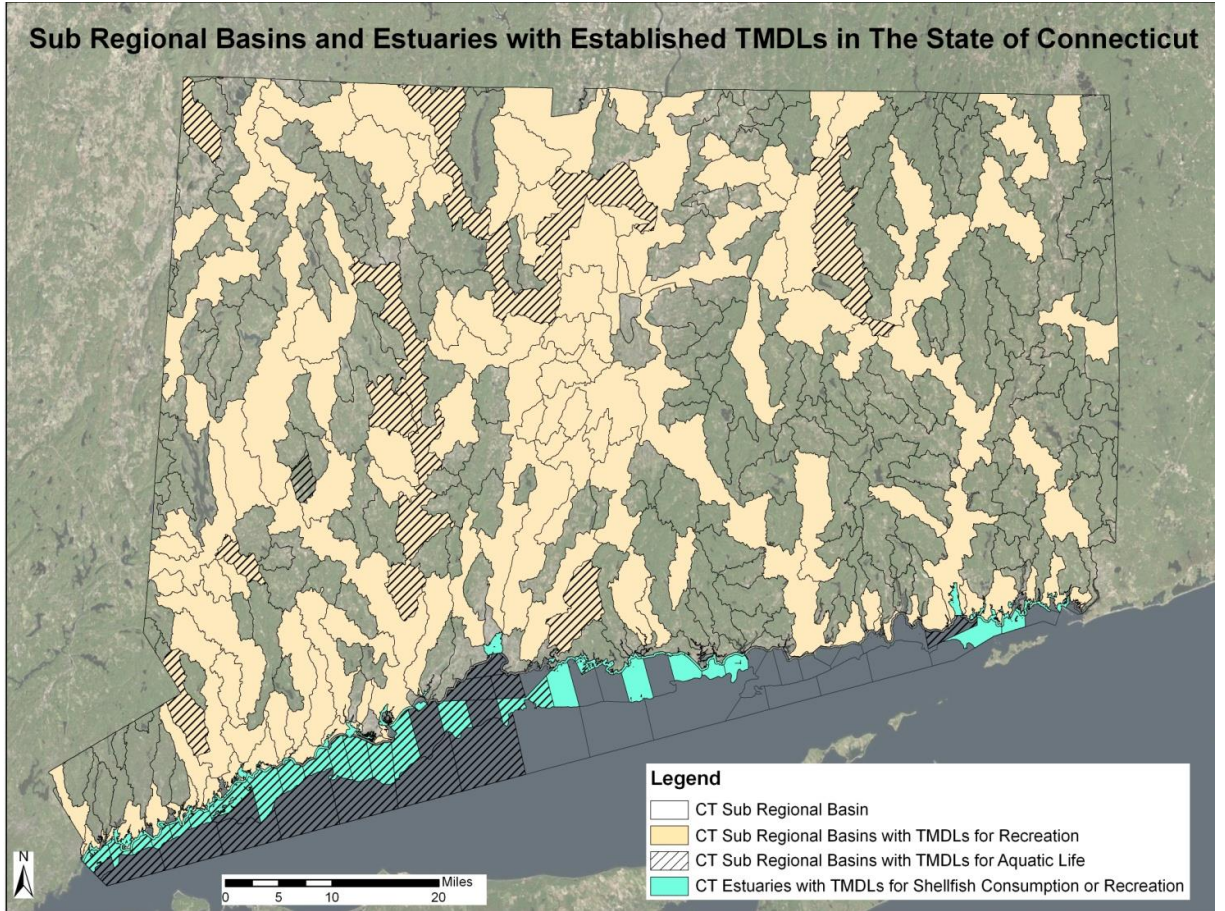
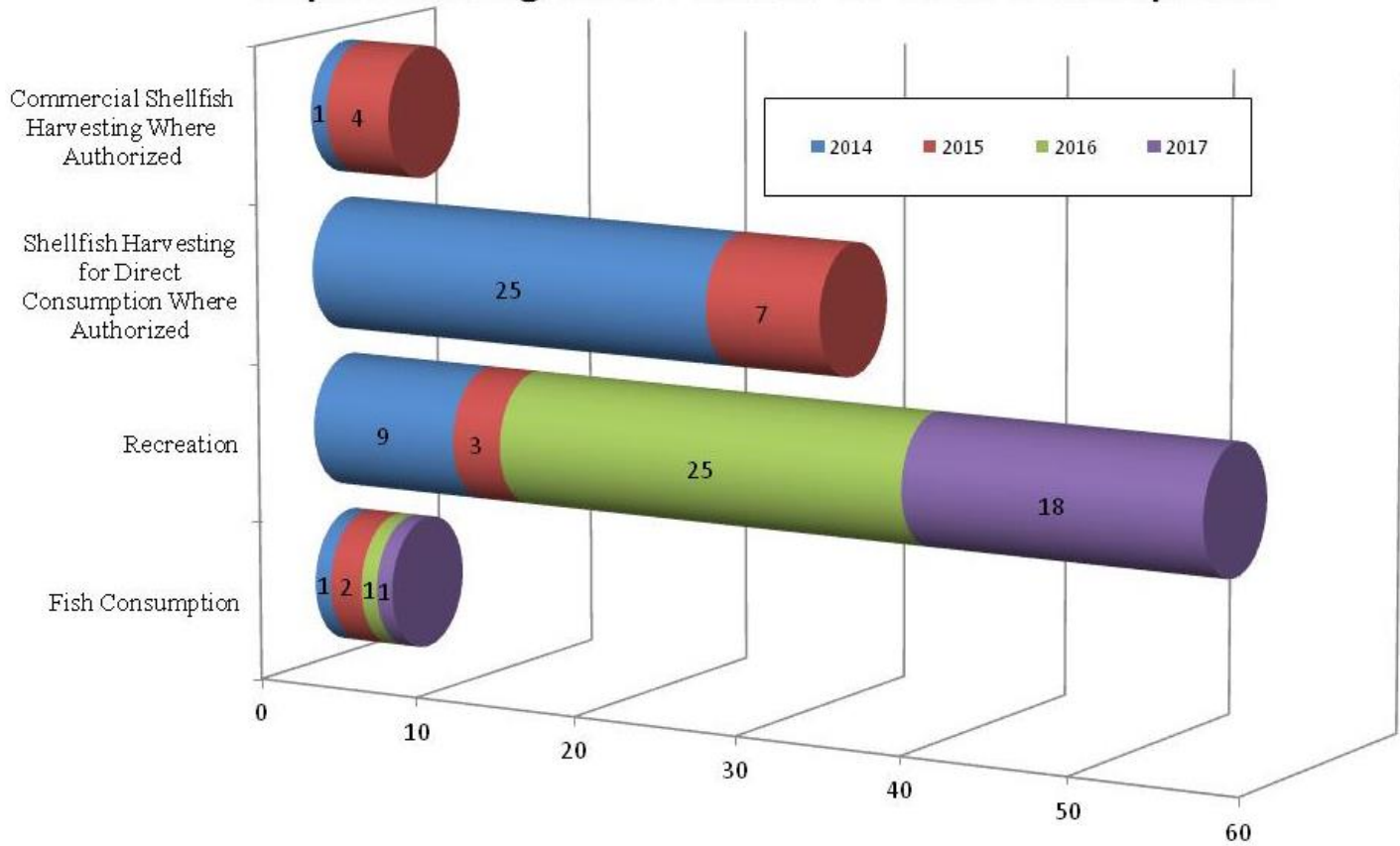


Figure 3-5 Subregional Basins and Estuaries with Established TMDLs in Connecticut



### Impaired Segments Planned for TMDL Development



For additional information, please see the full IWQR on the CT DEEP website at <http://www.ct.gov/dep/iwqr>.

## Appendix B: List of Potential Waters for Plan Development

Table 1. DRAFT Preliminary list of waterbodies for Action Plan Development by 2022.

Watershed ID	Watershed Name	Coastal Embayment Area	Protect / Restore	Active Planning Efforts	Potential Planning Partners	Water Quality Concerns
011000050306	Carse Brook – Housatonic River	N/A	Protect		X	Nutrients, Aquatic Life
011000050903	Pomperaug	N/A	Restore		X	Bacteria, Nutrients, Aquatic Life
011000050801	Headwaters Still River	N/A	Restore	X	X	Nutrients, Aquatic Life
011000050802	Limekiln Brook-Still River	N/A	Restore	X	X	Nutrients
011000060103	Outlet Saugatuck River	N/A	Restore	X	X	Nutrients
011000060102	Headwaters Saugatuck River	N/A	Protect	X	X	Bacteria, Nutrients, Aquatic Life
011000060202	Norwalk River	N/A	Restore		X	Bacteria, Nutrients, Aquatic Life
011000040302	West River	N/A	Restore	X	X	Bacteria, Nutrients, Aquatic Life
011000040103	Headwaters Quinnipiac	N/A	Restore		X	Nutrients, Aquatic Life
011000040105	Outlet Quinnipiac River	N/A	Restore		X	Nutrients, Aquatic Life
011000040206	Farm River	N/A	Restore		X	Nutrients, Aquatic Life



Watershed ID	Watershed Name	Coastal Embayment Area	Protect / Restore	Active Planning Efforts	Potential Planning Partners	Water Quality Concerns
010802070204	Lower West Branch Farmington River	N/A	Protect	X	X	Nutrients
010802070602	Mill Brook-Farmington	N/A	Restore	X	X	Nutrients, Aquatic Life
010802050203	Lower Scantic River	N/A	Restore	X		Bacteria, Nutrients, Aquatic Life
010802050504	Roaring Brook	N/A	Protect			Nutrients
010802050903	Eightmile River	N/A	Protect		X	Nutrients
011000020205	Mount Hope River	N/A	Protect	X	X	Nutrients
011000020206	Sawmill Brook-Natchaug River	N/A	Protect	X	X	Nutrients
011000030304	Niantic River	N/A	Restore	X	X	Bacteria, Nutrients
011000030301	Mystic River	N/A	Restore			Nutrients
011000030303	Stony Brook-Frontal Fishers Island Sound	N/A	Restore			Nutrients, Aquatic Life
010900050303 / 010900050301	Pawcatuck River / Ashaway River	N/A	Restore / Protect	X	X	Nutrients
	N/A	Saugatuck Estuary	Restore		X	Nutrients
	N/A	Norwalk Harbor	Restore		X	Nutrients
	N/A	Southport Harbor / Sasco Brook	Restore	X	X	Nutrients
	N/A	Farm River	Restore		X	Nutrients
	N/A	Niantic Bay	Restore	X	X	Nutrients
	N/A	Mystic Harbor	Restore		X	Nutrients

Watershed ID	Watershed Name	Coastal Embayment Area	Protect / Restore	Active Planning Efforts	Potential Planning Partners	Water Quality Concerns
	N/A	Stonington Harbor / Pawcatuck River	Restore		X	Nutrients

## Appendix C: Fact Sheet: Improving Agricultural Practices Improves North Running Brook



## Section 319

# NONPOINT SOURCE PROGRAM SUCCESS STORY

# Connecticut

## Improving Agricultural Practices Restores North Running Brook

### Waterbody Improved

Excessive nutrients from dairy farm runoff had impaired Connecticut's North Running Brook. As a result, the Connecticut Department of Energy and Environmental Protection (DEEP) added the brook to the state's 2004 Clean Water Act (CWA) section 303(d) list of impaired waters for not supporting its aquatic life use. Local, state and federal partners collaborated with local farm producers to implement targeted agricultural best management practices (BMPs). The BMPs include improved manure management and silage leachate collection, as well as agronomic practices such as no-till/minimum tillage and continuous cover crops. Improved water quality prompted DEEP to remove the 0.19-mile impaired segment of North Running Brook from the state's impaired waters list in 2012.

### Problem

North Running Brook is a 2.5-mile-long tributary nested within the 39-square-mile Muddy Brook and Little River watersheds in northeastern Connecticut. North Running Brook drains a largely rural, upland watershed with a locally high percentage of active agricultural land (21 percent) in eight large dairy farms and an additional 57 percent in forested landscape. The watershed is experiencing a trend of greater commuter-based rural residential development and its commensurate activities and impacts; as a result, some urban development pockets are present.

Twenty years of DEEP and U.S. Geological Survey water quality monitoring program data from the Muddy Brook and Little River watersheds indicated excessively high nutrient levels in several streams and river impoundments. An assessment of data collected in 2003 from the lower stretch of North Running Brook showed that macroinvertebrate populations were dominated by pollution-tolerant species and lacked diversity; therefore, they did not meet the state's water quality criteria for benthic macroinvertebrate communities. DEEP's in-stream field work identified an extremely thick fungal mat across the stream substrate at the confluence with a nearby farm field ditch, which indicated silage leachate discharges coming from upstream corn/hay silage storage (Figure 1). The silage leachate contained high concentrations of sugars and nutrients, which even in small amounts can deplete oxygen, killing fish and other aquatic organisms. Sampling immediately upstream of the ditch and its silage leachate input revealed stream conditions typical of a high-quality, small headwater stream.



Figure 1. A farm ditch contributed silage leachate and farm runoff to North Running Brook.

As a result of data assessment and the threat of future leachate discharges occurring, DEEP placed a segment of the brook (segment CT3708-10-02) on its 2004 CWA section 303(d) list of impaired waters for failing to support the aquatic life designated use.

### Project Highlights

The Eastern Connecticut Conservation District (ECCD) used a 2005 CWA section 319 grant to complete an in-depth evaluation of land uses and farm practices in the impaired Muddy Brook and Little River watershed sections to identify ways to reduce nonpoint source pollution. The resulting information was used to develop the *2009 Muddy Brook and Little River Watershed-Based Plan*. Soon afterwards, DEEP and ECCD, in cooperation with the Connecticut



Figure 2. The completed silage bunker and leachate collection system helps to manage manure at Valleyside Farm in Woodstock, Connecticut.

office of the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), met with stakeholders to prioritize the opportunities identified in the watershed plan. As part of the process, the owners of a 250-head dairy farm with a history of responsible manure management expressed interest in fixing a continuing problem they had with silage leachate release. Following stakeholder agreement, ECCD received a CWA section 319 grant in 2010 to plan, design and add a portion of a silage leachate collection and transfer system to the farmers' nearby long-term manure storage facility (Figure 2).

The grant funds were used to develop plans, relocate and construct several silage bunkers, and redirect the flow of bunker-based silage leachate away from North Running Brook and into an underground pipe drainage system that leads to a secure manure storage facility. NRCS leveraged that work as part of the design and installation of a larger integrated collection, pumping and transport system. Overall construction was completed in mid-2011. Since project completion, NRCS staff have continued to provide additional technical agronomic assistance to the farm producers.

Over the past five years, NRCS has used Environmental Quality Incentive Program funds to partner with farmers throughout the larger Little River watershed to install waste storage facilities, improve nutrient management, and implement other practices to reduce nitrogen and phosphorus loadings. In 2012 the Little River watershed was selected as a National Water Quality Initiative (NWQI) priority watershed.

## Results

Implementing agricultural BMPs and improving agronomic practices reduced nutrients contained in barnyard and farm field runoff and allowed water quality to improve in North Running Brook. Benthic data collected in 2009 and 2010 show that North Running Brook scored 67 on a macroinvertebrate multimetric index (MMI), surpassing the minimum MMI score of 43 needed to indicate aquatic life support. Physical and chemical data collected during the same period also showed no exceedances of water quality criteria. On the basis of these data, DEEP determined that the lower North Running Brook segment meets the Connecticut Water Quality Standards for aquatic life use and removed a 0.19-mile segment from the state's 2012 CWA section 303(d) list.

## Partners and Funding

In 2010 ECCD received a \$111,000 CWA section 319 grant to implement agricultural BMPs on private farmland, along with a contributing match of \$104,000 and significant contributions from NRCS and the farm producers. ECCD and NRCS developed an operation and maintenance plan for the farm producers. The farm producers own, operate and maintain the silage leachate system, which has an estimated design life of 25 years.

A technical transfer workshop for area farmers was then held, and NRCS national Chief Dave White and state and federal agency and legislative representatives visited the site in the summer of 2012. An additional large dairy farm producer who attended the site tour has since collaborated with the listed partners to install a silage leachate collection system to further protect an adjacent tributary feeding Muddy Brook.

DEEP and ECCD continue to partner with the Town of Woodstock, the Woodstock History Society and Roseland Lake Association, all of which have also demonstrated support and assistance by installing demonstration bioretention and riparian buffer plantings, using \$63,000 in CWA section 319 funds and contributing \$45,000 in matching funds. DEEP and ECCD used another \$152,000 in CWA section 319 funds to help additional animal agricultural producers implement BMPs in the watershed. The Last Green Valley, Inc., a nonprofit group, helped ECCD to conduct water quality monitoring to assess improvements.



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