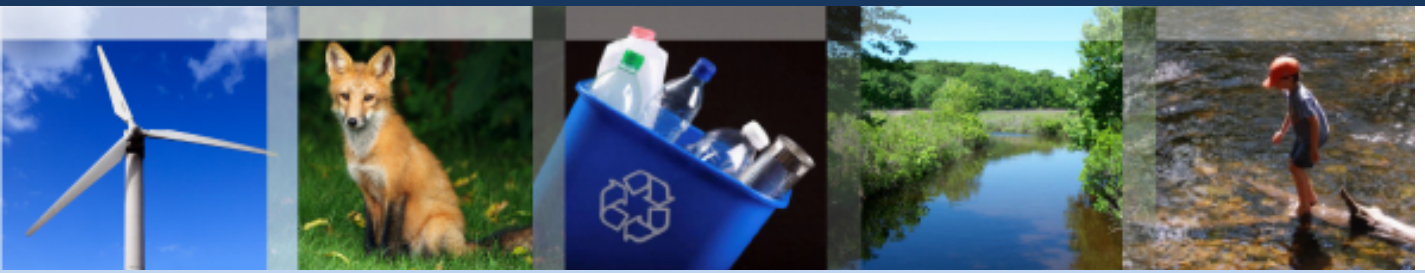
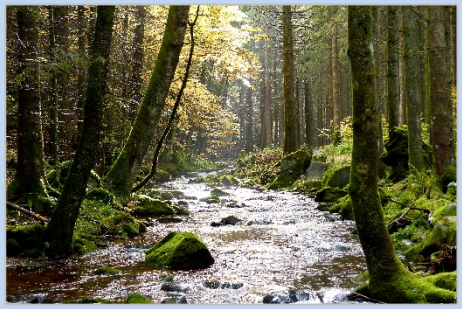
Connecticut Department of Energy and Environmental Protection



Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION



Integrated Water Resource Management:

Taking Action to Restore and Protect Water Quality

June 20, 2016

Rob Hust, Traci Iott & Chris Sullivan

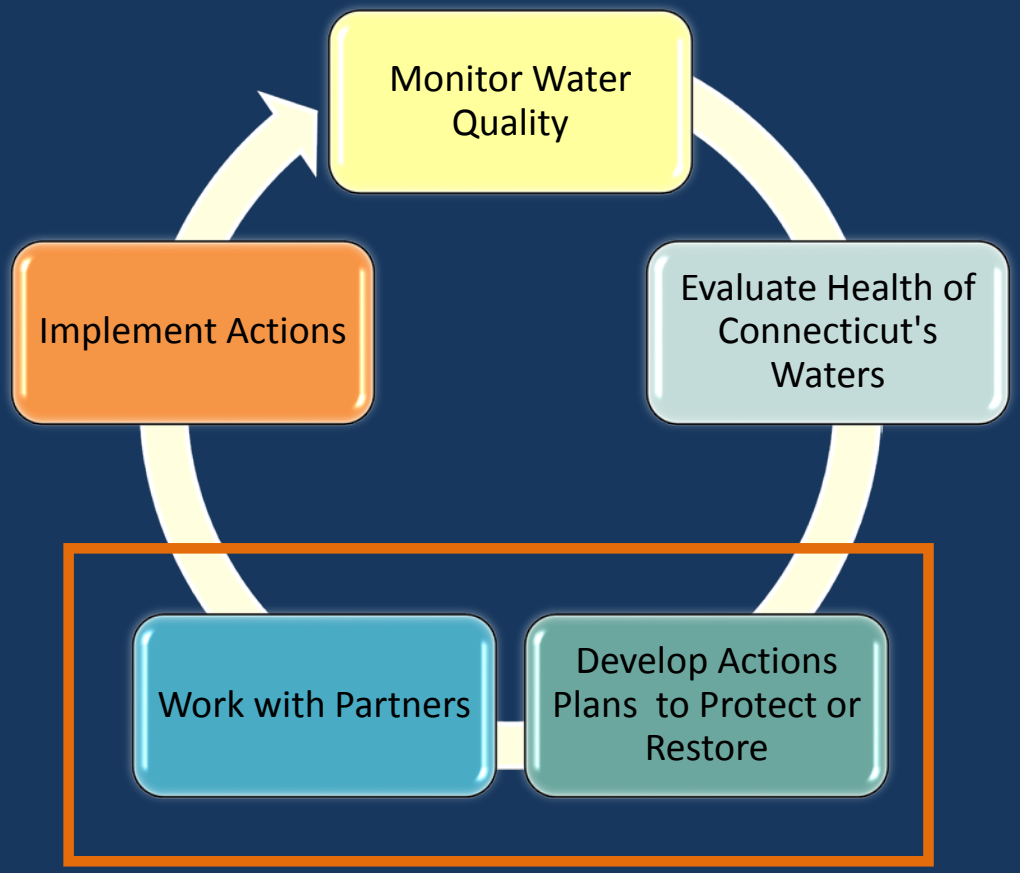
Public meetings at CT DEEP Offices, Hartford & Goodwin College, East Hartford

Connecticut Department of Energy and Environmental Protection

Integrated Water Resource Management

- A renewed approach to focusing existing programs to achieve Water Quality goals
- Works within existing regulatory frameworks – No new regulatory requirements

Environmental Protection Process



Integrated Water Resource Management

- Develop plans that lead to water quality restoration and protection
- Build on & expand internal & external partnerships

Integrated Water Resource Management

Environmental Data & Goals → Action Plan: Bridging the Gap → Implementation Program

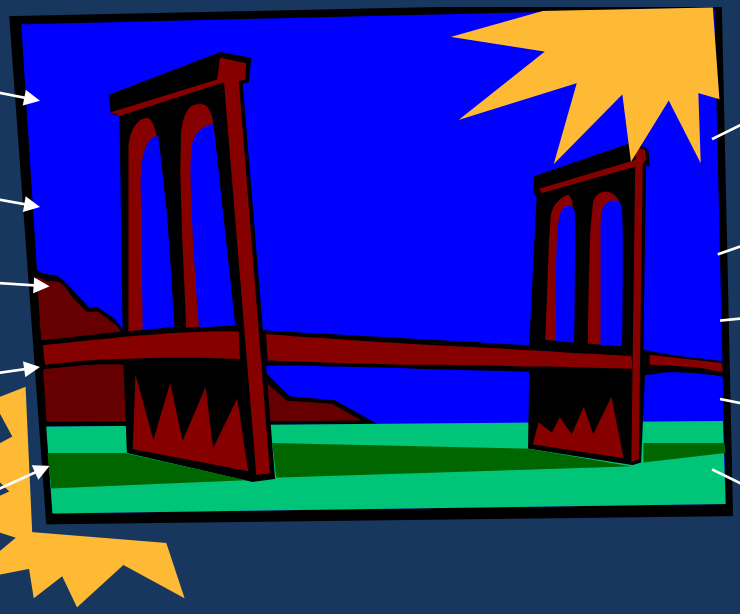
Data

Criteria

Monitoring

Standards

Natural Resource Information



Groundwater Remediation

Non-point Source

Wastewater Permitting

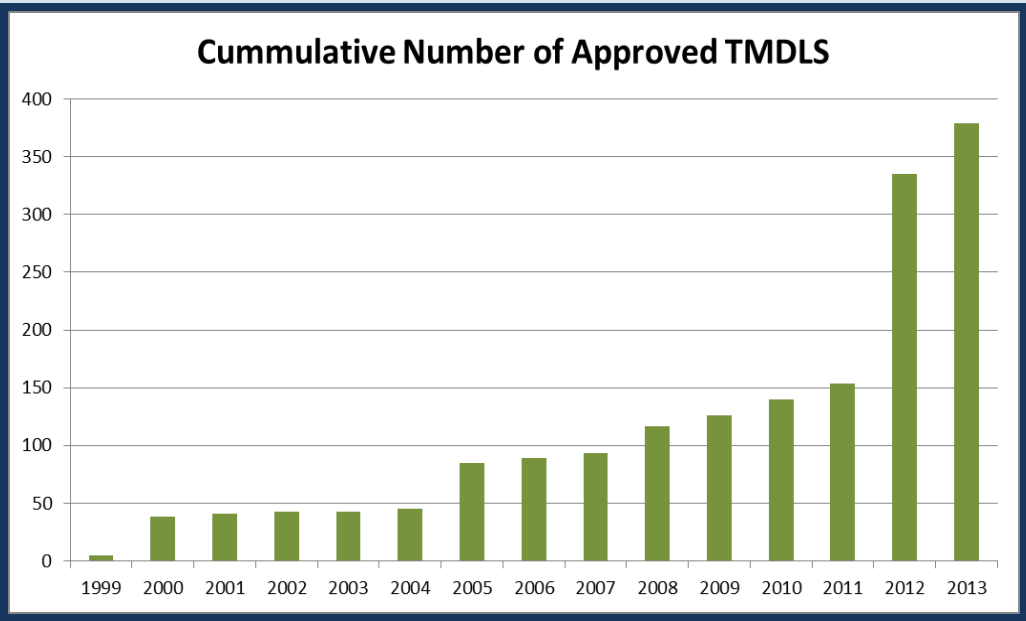
Natural Resource Management

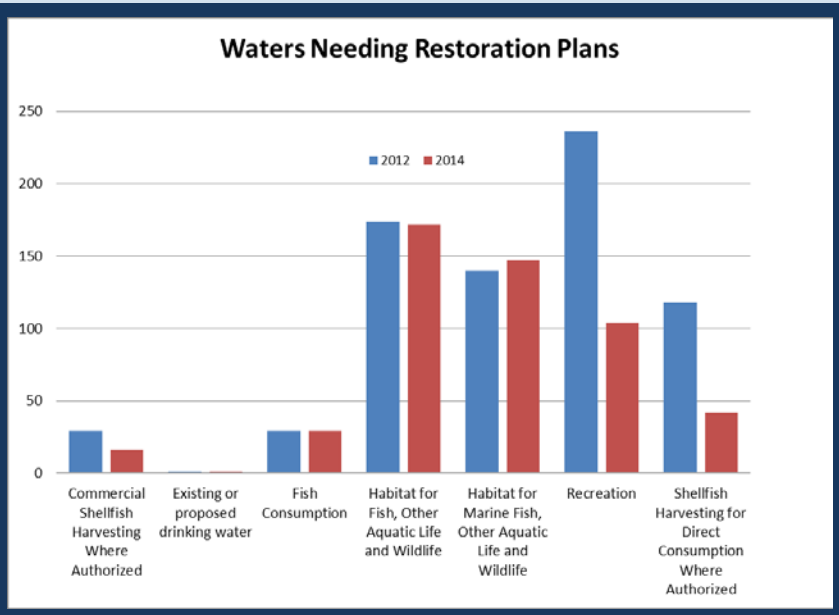
Watershed Plans

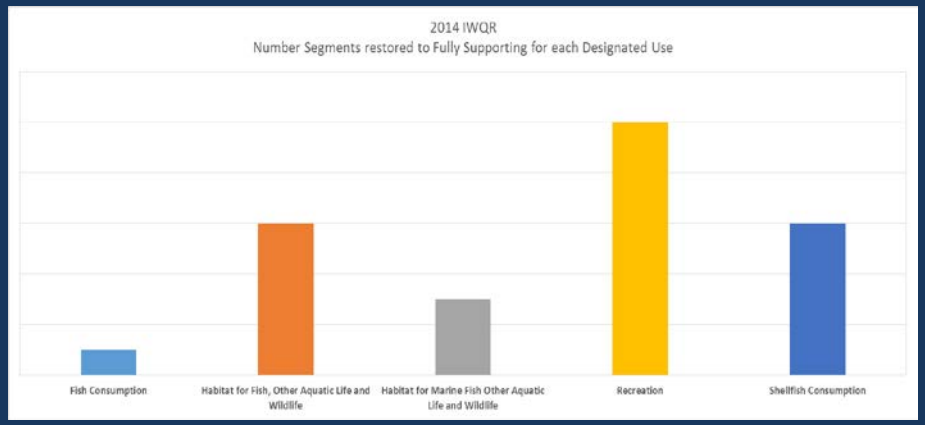
Establishing Action Plans to Restore and Protect Water Quality

Why take a new approach?

Restoring Water Quality In CT







Components of Integrated Water Resource Management

Connecticut-Specific Water Quality Concerns

CT-Specific WQ Concerns

Information on CT Watersheds

Restore & Protect

Communicate

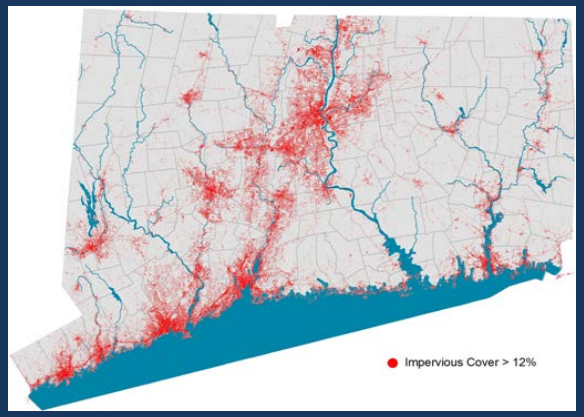
Collaborate

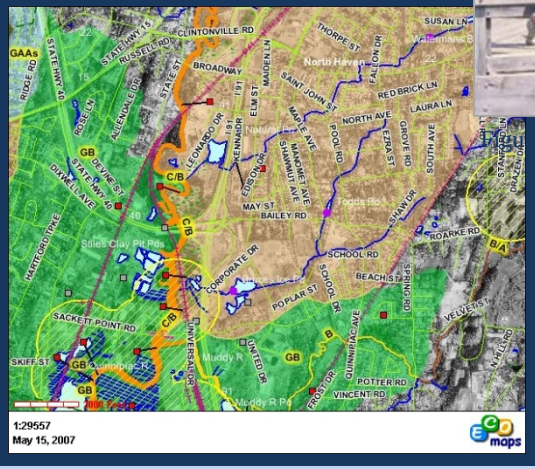
Use the right tool for the job

- Options for how to identify water quality concerns
  - Pollutant
  - Pollutant Types or Groups
  - Watershed
  - Designated Use
  - Sources
  - Implementation Ability

Information on CT Watersheds

- CT-Specific WQ Concerns
- Information on CT Watersheds
- Restore & Protect
- Communicate
- Collaborate
- Use the right tool for the job

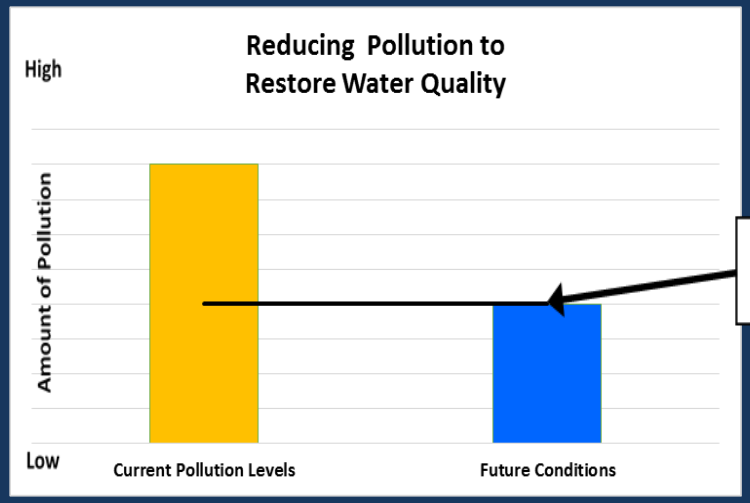




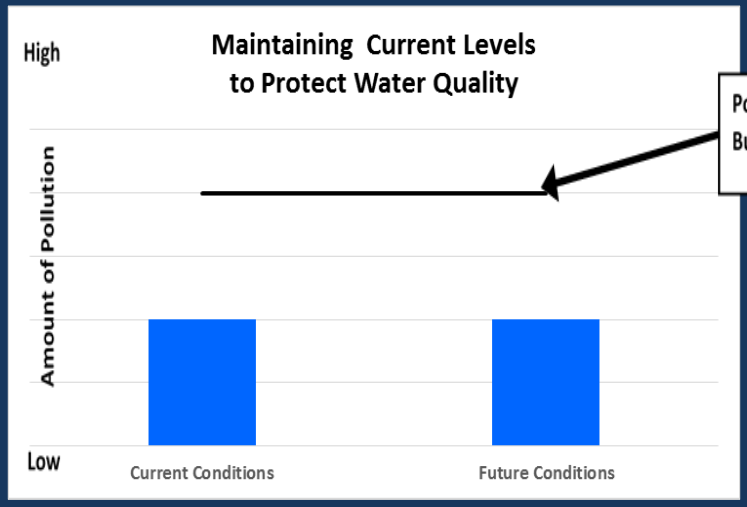
Connecticut Department of Energy and Environmental Protection

Restore & Protect

- CT-Specific WQ Concerns
- Information on CT Watersheds
- Restore & Protect
- Communicate
- Collaborate
- Use the right tool for the job



Restoration



Protection

Communicate & Collaborate

CT-Specific WQ Concerns

Information on CT Watersheds

Restore & Protect

Communicate

Collaborate

Use the right tool for the job

- Web Site
- Email Notification
- Meetings
- Public Comment Opportunities
- Innovative Approaches
- Work with Partners
- Collaborate

Use the Right Tool for the Job

CT-Specific WQ Concerns

Information on CT Watersheds

Restore & Protect

Communicate

Collaborate

Use the right tool for the job

- Examples of Types of Plans
  - Total Maximum Daily Load Analyses (TMDLs)
  - TMDL Alternatives
    - Watershed Based Plans
    - Straight to Implementation
    - Site-specific Approaches
    - Other

Use the type of plan that will best address the Water Quality concern

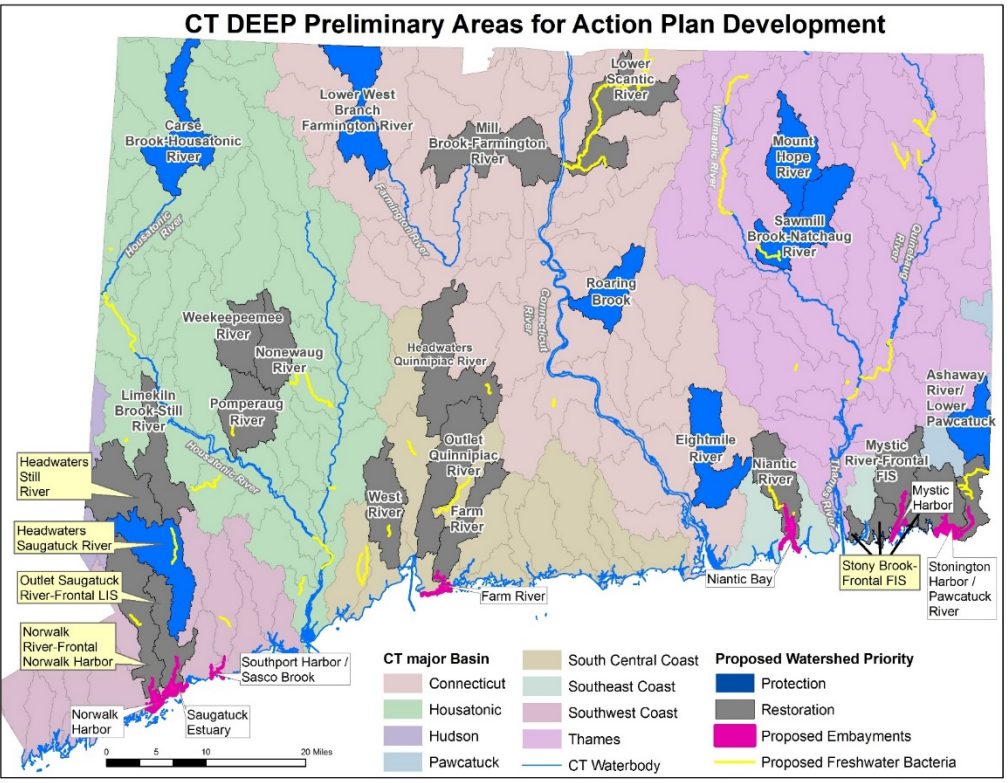
General Steps to Develop a Plan

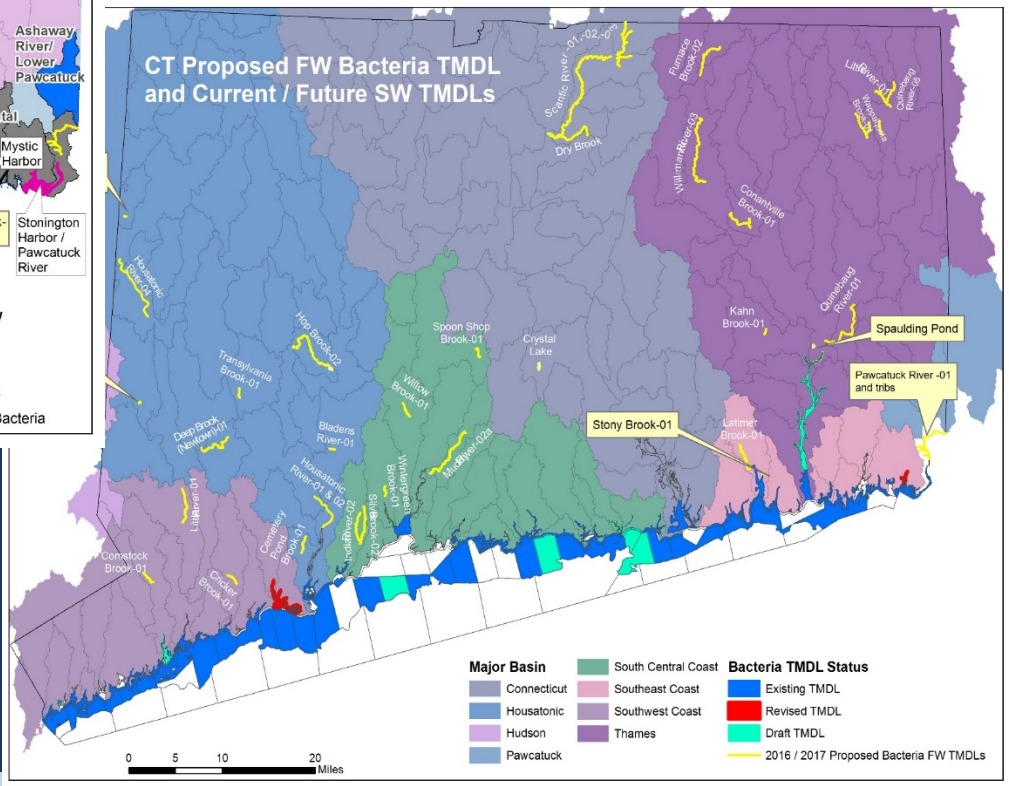
- Review existing data
  - Land use & Activities
  - Physical, chemical, biological
- Identify &Fill in data gaps
- Analyze and model information
- Develop a plan
- Work with partners
- Finalize Plan
- Implement

Hypothetical Plan Development Schedule

Plans	2016	2017	2018	2019	2020	2021	2022
A	Simple						
B							
C							
D							
E							
F	C	o	m	p	l	e	x
G							

Preliminary Set of Waters for Plan Development





Comments Requested on Initial List

Public Comment Period: May 27-June 30, 2016

- Written or email comments accepted
- Provide input on selection of waters for initial plan development
- DEEP will review and may revise list of waters for plan development based on public comment
- Final list will be provided to EPA

Web Page & Story Map

Connecticut's Integrated Water Resource Management

Surface waters such as rivers, streams, lakes, embayments (an indentation of a shoreline which forms a bay) and Long Island Sound, are important resources for residents, businesses and for fish and wildlife in Connecticut. Through Integrated Water Resource Management, the Connecticut Department of Energy and Environmental Protection (DEEP) is looking to develop action plans and strengthen partnerships to better protect and restore water quality.
DEEP is currently working to identify waters and watersheds for action plan development during the next six years (2016-2022).

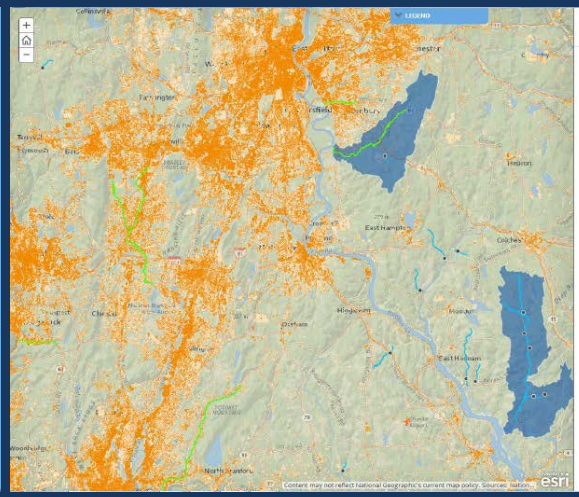
This Story Map was prepared to help you understand and explore the areas that DEEP is considering for action plan development.

How To Use This Story Map:

1. Hover on the dot for frame title
2. Select the dots to select a frame or
3. Scroll down to the bottom of the text box to view the next panel
4. Select the 'Legend' box to expand or collapse the Legend
5. Zoom in using the control arrows to view more detail
6. Select an item in the map for specific information

Why Establish Action Plans for Connecticut's Waterbodies?

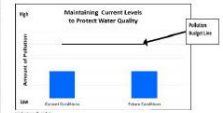
Under the Federal Clean Water Act, States develop plans called Total Maximum Daily Loads (TMDLs) to restore waters with impaired water quality and protect waters with good water



Connecticut's Integrated Water Resource Management

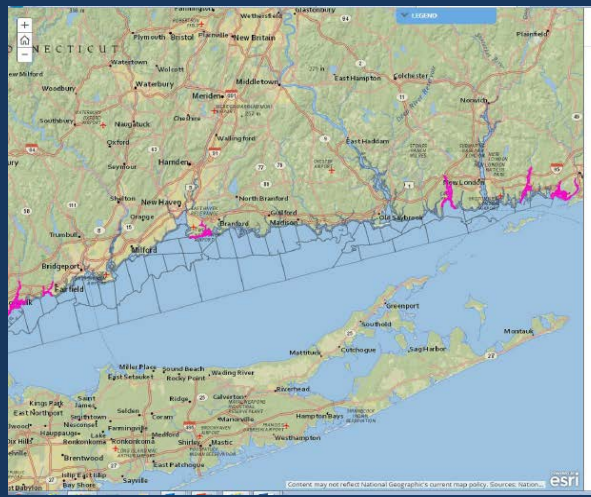
Protect What's Good: Watersheds Selected for Protection

This draft list of Connecticut waters also includes areas that currently have good water quality. The objective for these areas is to develop action plans that support maintaining and protecting the good water quality that is currently found in the watershed.



Protecting Recreation and Shellfishing: Connecticut's Bacteria Impairments

The waterbodies displayed in this map were chosen because they are not meeting water quality standards for recreational or shellfishing uses.
Escherichia coli, Enterococci and Fecal coliform bacteria are used as Connecticut's primary



Connecticut's Integrated Water Resource Management

Coastal Embayments Considered for Action Plan Development

In addition to a drafted list of inland watersheds and bacteria segments, Connecticut DEEP is also proposing several coastal embayment areas to focus their planning efforts over the next six years. This draft list of embayments are areas where data has been collected, or where there are other studies and work efforts currently underway. Nitrogen loading studies are being conducted by the University of Connecticut researchers to address water quality issues caused by excess nutrients in some of these selected embayments. Additionally, the Bureau of Aquaculture has indicated that some of the embayment areas shown in the map are areas where they are planning to focus their work efforts in the coming years.

For more information about these areas, select a coastal embayment.

The Big Picture: Draft List of Waters for Action Plan Development

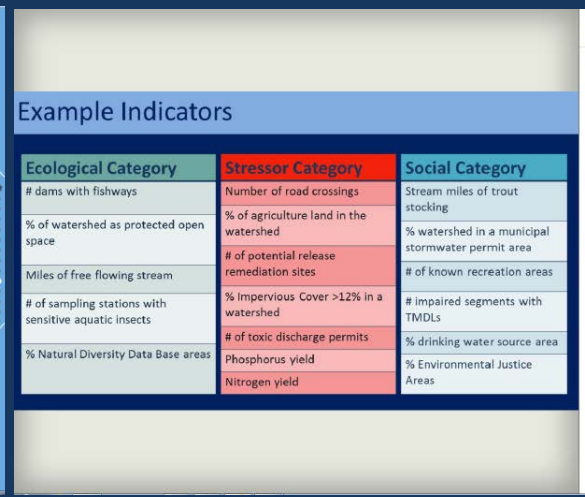
This map displays all of the waters and watersheds proposed for development of protection and restoration action plans over the next six years.

For more detailed information including the screening process, results and lists of indicators used in each of the successive phases see the technical report, *Identifying Watersheds for Restoration and Protection: Action Plans with Connecticut Integrated Water Resource Management Efforts.*

We Would Like to Hear From You!

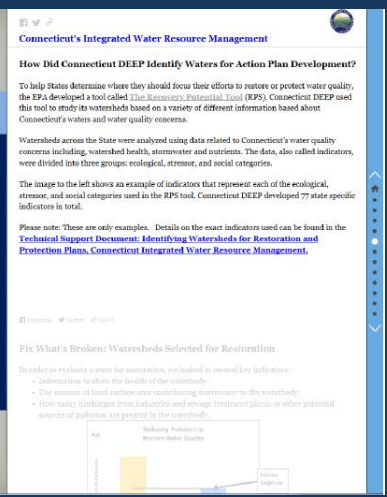
This initial listing of potential waters for plan development is being offered for public review and comment. We would like to hear from you. We are particularly interested in working with partners to achieve restoration and protection goals for Connecticut's water resources.

- Is there a watershed or waterbody that you would like to see on this list?



Example Indicators

Ecological Category	Stressor Category	Social Category
# dams with fishways	Number of road crossings	Stream miles of trout stocking
% of watershed as protected open space	% of agriculture land in the watershed	% watershed in a municipal stormwater permit area
Miles of free flowing stream	# of potential release remediation sites	# of known recreation areas
# of sampling stations with sensitive aquatic insects	% Impervious Cover >12% in a watershed	# impaired segments with TMDLs
% Natural Diversity Data Base areas	# of toxic discharge permits	% drinking water source area
	Phosphorus yield	% Environmental Justice Areas
	Nitrogen yield	



Connecticut's Integrated Water Resource Management

How Did Connecticut DEEP Identify Waters for Action Plan Development?

To help States determine where they should focus their efforts to restore or protect water quality, the EPA developed a tool called The Recovery Potential Tool (RPS). Connecticut DEEP used this tool to study its watersheds based on a variety of different information based about Connecticut's waters and water quality concerns.

Watersheds across the State were analyzed using data related to Connecticut's water quality concerns including, watershed health, stormwater and nutrients. The data, also called indicators, were divided into three groups: ecological, stressor, and social categories.

The image to the left shows an example of indicators that represent each of the ecological, stressor, and social categories used in the RPS tool. Connecticut DEEP developed 77 state specific indicators in total.

Please note: These are only examples. Details on the exact indicators used can be found in the **Technical Support Document: Identifying Watersheds for Restoration and Protection Plans, Connecticut Integrated Water Resource Management.**

Fix What's Broken: Watersheds Selected for Restoration

In order to evaluate waters for restoration, we looked at several key indicators:

- Information to show the health of the waterbody
- The amount of land surface area contributing stormwater to the waterbody
- How many discharges from industries and sewage treatment plants or other potential sources of pollution are present in the watershed.

http://www.ct.gov/deep/iwrm

Connecticut Department of Energy and Environmental Protection

Expected Long Term Schedule

2016
- Public Comment on Waters List
- Potential for Public Notice of Draft Plans

2017
- Potential for Public Notice of Draft Plans

2018
- Public Comment on Waters List
- Potential for Public Notice of Draft Plans

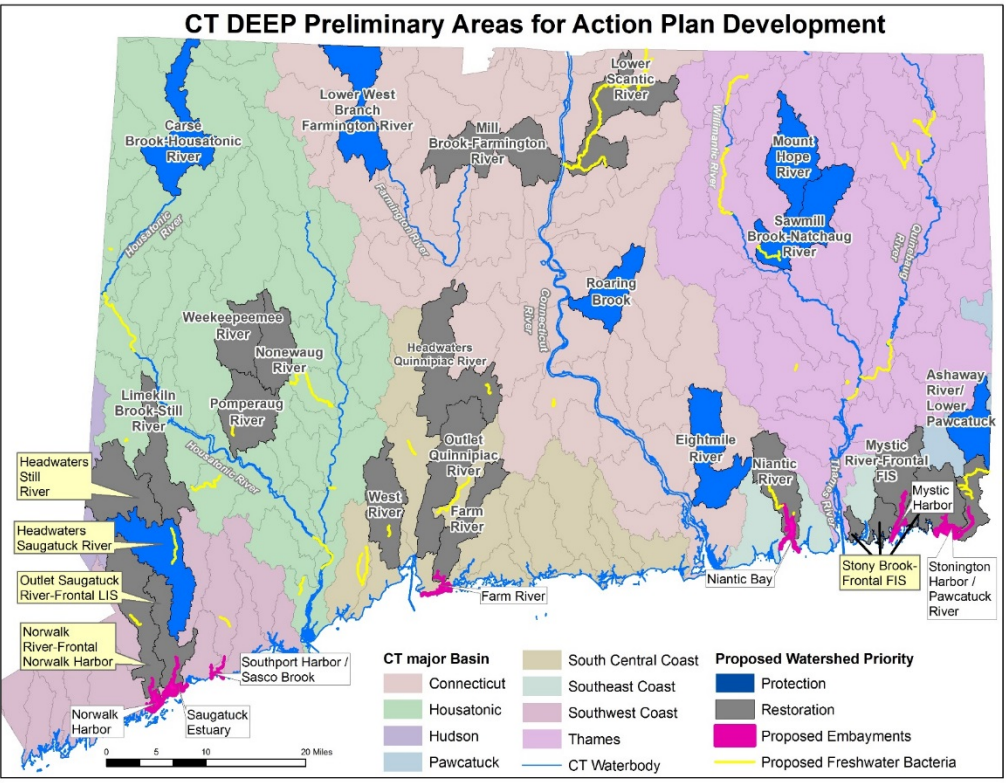
2019
- Potential for Public Notice of Draft Plans

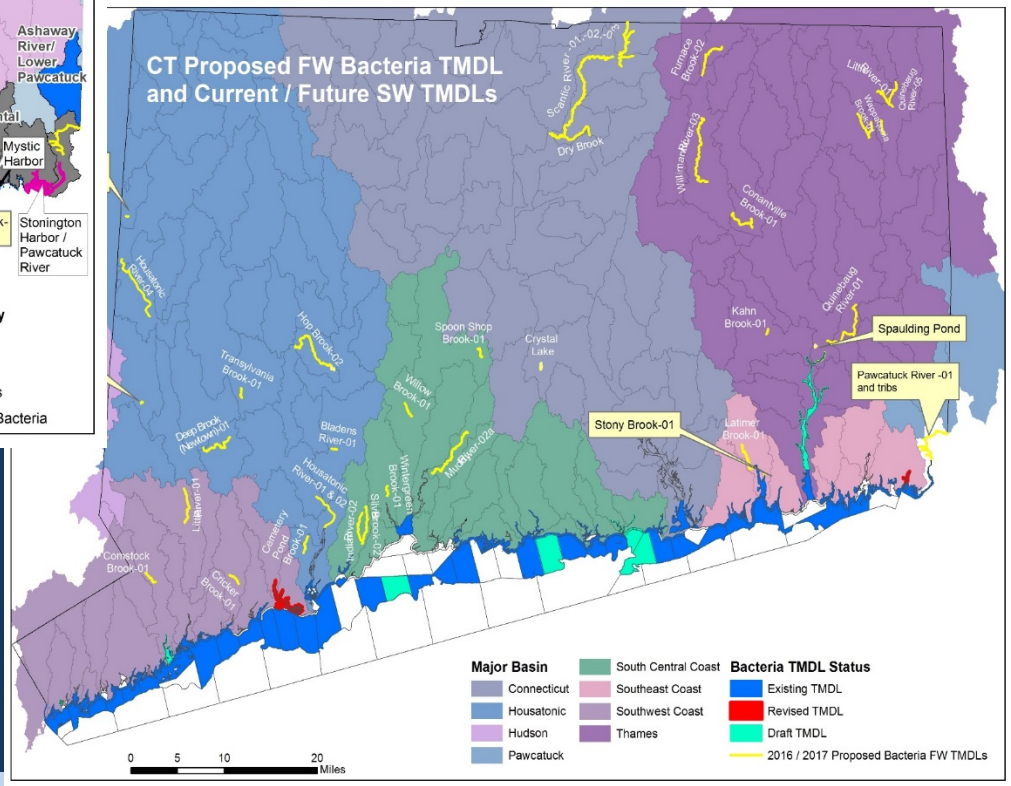
2020
- Public Comment on Waters List
- Potential for Public Notice of Draft Plans

2021
- Potential for Public Notice of Draft Plans

2022
- Public Comment on Waters List
- Potential for Public Notice of Draft Plans

More Information on Selection of Waters





Connecticut Department of Energy and Environmental Protection

Waterbody Evaluation

- Initial Screening
- Further comparison
- Review List
- Public Engagement
- Submit to EPA

Recovery Potential Screening (RPS)

EPA Tool to help States compare restorability across all watersheds

- Considers return on investment in water quality
- Systematic but very flexible approach
- Science-based, indicator-driven (GIS and field data sources)

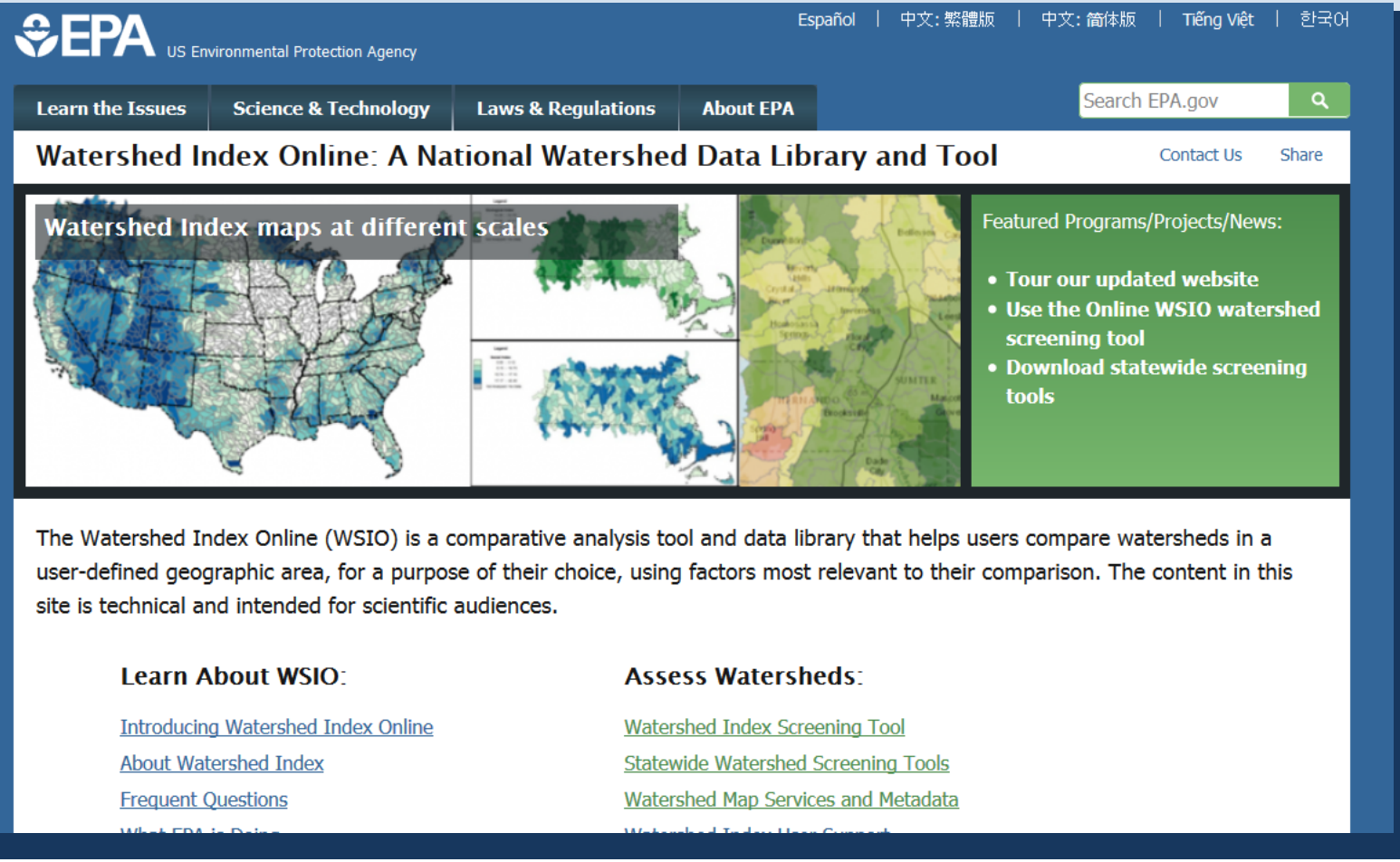
Recovery Potential Screening - Basic Concept

Ecological Category	Stressor Category	Social Category
# dams with fishways	Phosphorus yield	# impaired segments with TMDLs
# of sampling stations with sensitive aquatic insects	% Impervious Cover >12% in a watershed	Stream miles of trout stocking
% of watershed as protected open space	# impacted toxicity results	# of known recreation areas
Indicator 4	Indicator 4	Indicator 4
Indicator 5….	Indicator 5….	Indicator 5….

Ecological Index **Stressor Index** **Social Index**

$$\frac{\text{Ecological} + \text{Social} + (100 - \text{Stressor})}{3} = \text{RPI}$$

Watershed Index Online



- https://www.epa.gov/watershed-index-online

Overview of Watershed Selection

Enhance Prioritization Tool

- Acquire CT Specific Indicators
- Develop Indicators

Develop Scenarios for Tool

- Select Indicators & Weights
- Compare impacts of adjusting indicators

Extract results Further Analysis

- Sort and Filter Watersheds
- Rank and Select Common Watersheds

Publish DRAFT list of Watersheds for Comments

- Include priorities outside Tool results
- Engage Public with Complete DRAFT list

Example Indicators

Ecological Category	Stressor Category	Social Category
# dams with fishways CT	Number of road crossings	Stream miles of trout stocking CT
% of watershed as protected open space	% of agriculture land in the watershed	% watershed in a municipal stormwater permit area
Miles of free flowing stream CT	# of potential release remediation sites CT	# of known recreation areas CT
# of sampling stations with sensitive aquatic insects	% Impervious Cover >12% in a watershed	# impaired segments with TMDLs
% Natural Diversity Data Base areas CT	Toxicity results CT	% drinking water source area
	Phosphorus yield	% Environmental Justice Areas CT
	Nitrogen yield	

CT Water Quality Scenarios

General Watershed Health

- Restoration
- Protection

Stormwater

- Restoration
- Protection

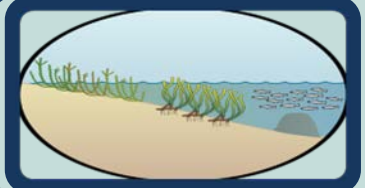
Nutrients

- Restoration
- Protection

SIX RPS TOOL SCENARIOS GENERATING SIX LISTS OF WATERSHEDS

Bacteria Impairments Current and Future

(not tool based)



Estuaries and Embayments (not tool based)

Overview of Prioritization Tool

Enhance Prioritization Tool

- Acquire CT Specific Indicators
- Develop Indicators

Develop Scenarios for Tool

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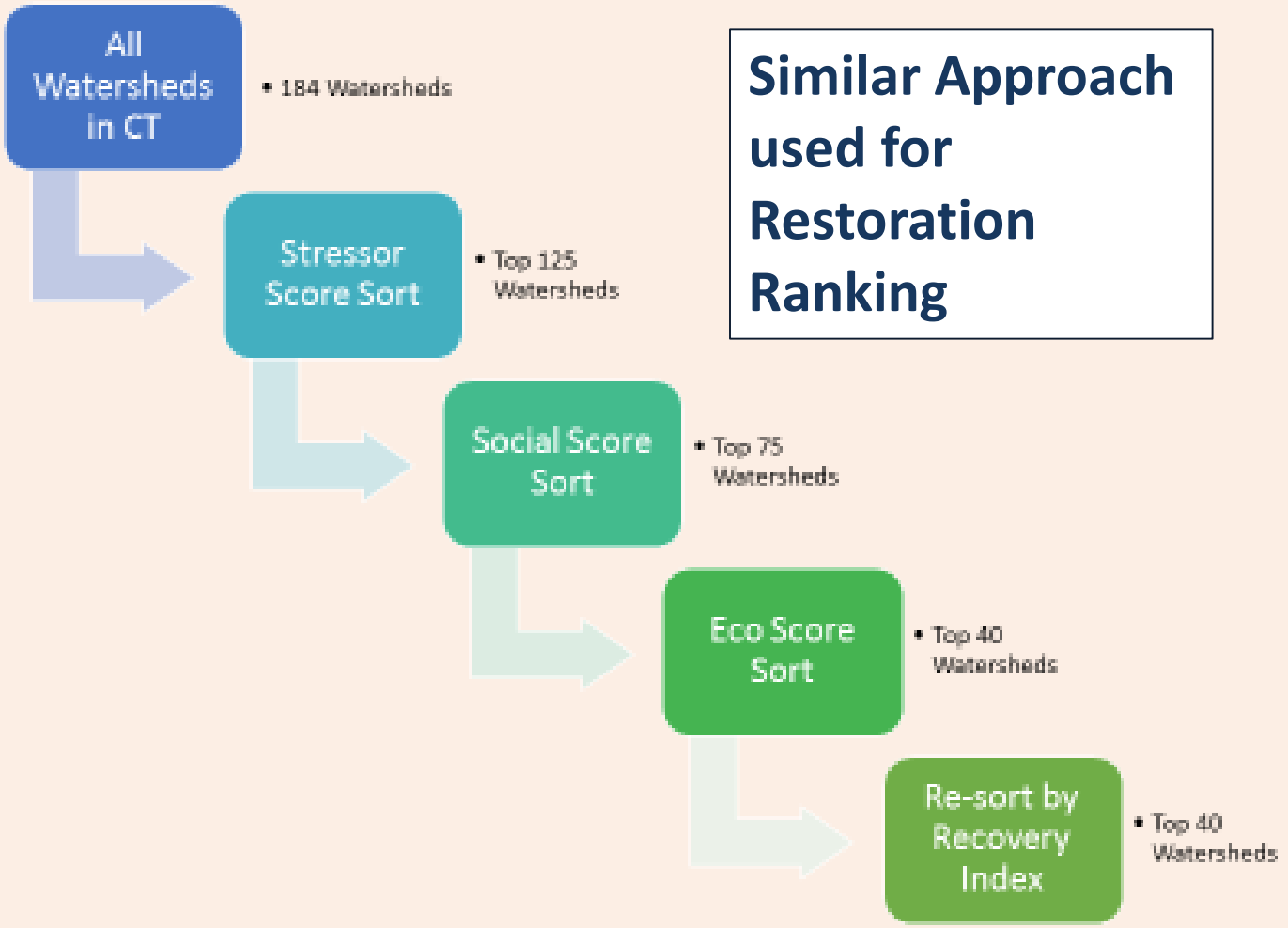
Screening Results Analysis

Method of Using Protection Rankings from Recovery Potential Screening Tool



Similar Approach used for Restoration Ranking

Sorting Results

Stormwater Top 20 Watersheds	Nutrient Top 20 Watersheds	General Watershed Health Top 20 Watersheds
Watershed A Watershed B Watershed C	Watershed A Watershed B	Watershed B Watershed C

Only Watershed B added to Priority List

Additional Evaluation

- Partners
- Refined Data
- Existing Monitoring Data
- Other Scenarios

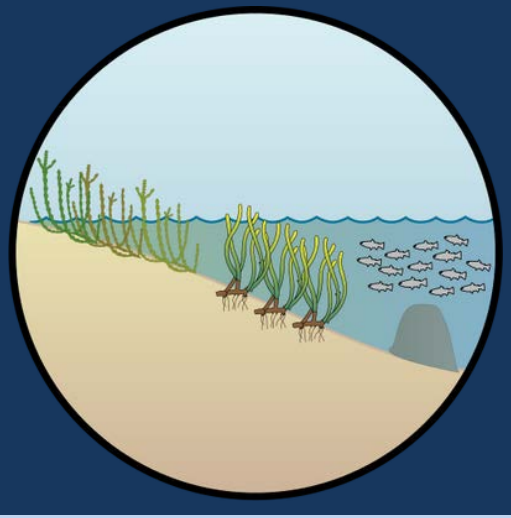
Coastal Embayments

Nitrogen Strategy

Monitoring

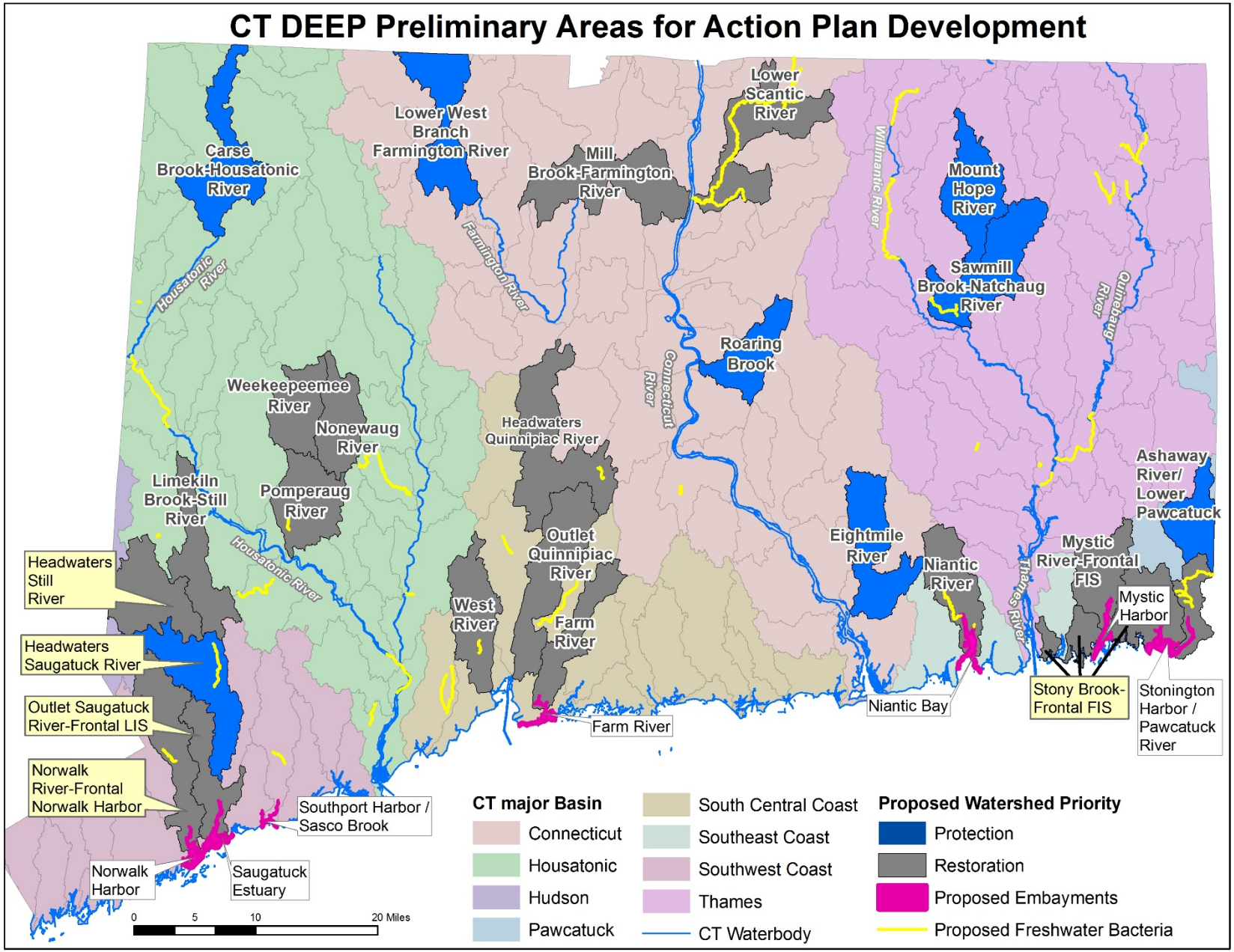
Shellfishing

Recreation



Eelgrass

Preliminary Focus Watersheds



Next Steps

- Submit Feedback and Comments
- christopher.Sullivan@ct.gov
- CT DEEP WPLR 79 Elm Street
  Hartford, CT 06106
  Attn: Mr Christopher Sullivan
  Planning and Standards Division
- Feedback accepted **May 27 – June 30**
- www.ct.gov/deep/iwrm