



# Connecticut Department of Energy and Environmental Protection



Connecticut Department of  
**ENERGY &  
ENVIRONMENTAL  
PROTECTION**

# Addressing Nutrients in CT Lakes: Bantam Lake Project

May 13, 2020  
CTDEEP Presentation  
Teleconference with Local Stakeholders



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# Agenda

- Welcome and Introductions (All)
- Overview of Bantam Lake Coalition and local activities (Connie Trolle)
- Presentation of current Bantam Lake project work (Traci lott & Erik Bedan)
- Open Discussion (All)

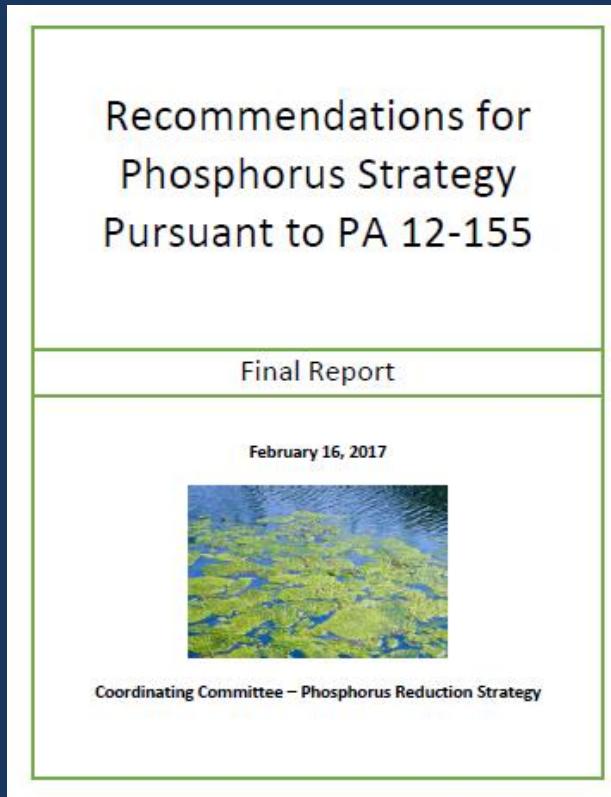


# Presentation Objectives

- Provide an overview of the on-going project involving Bantam Lake
  - How did the project start?
  - Goals and Objectives?
  - New approach to addressing nutrients and lakes?
  - Why Bantam Lake?
  - Components of the Project?
  - What are the benefits to the communities?
  - What role do watershed partners play?
  - Provide update on projects and activities



# How did the project start?



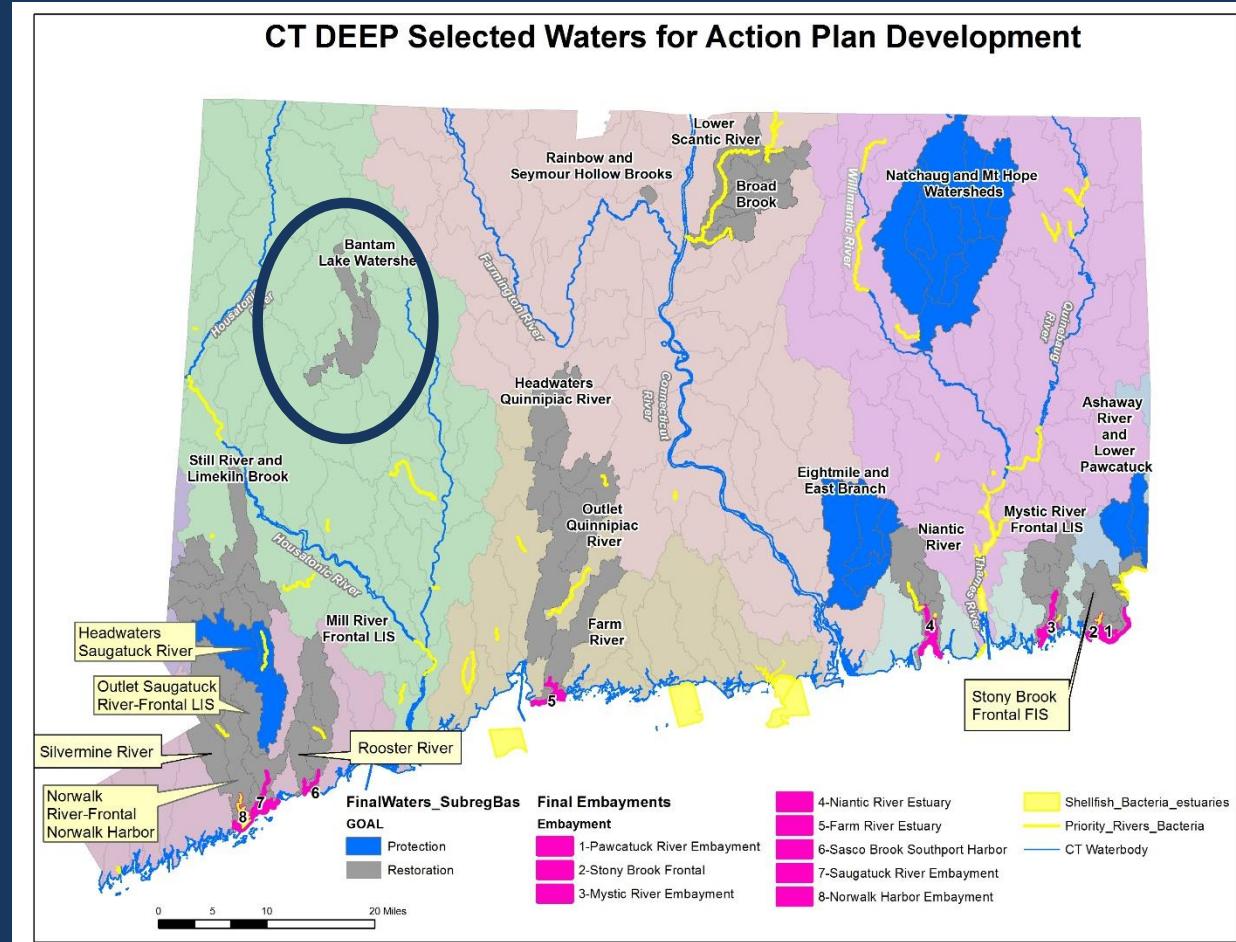
Both efforts include a focus on nutrients and recommend that approaches be developed to address impacts on lakes



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# Nutrient Impacts on Lakes

- Identified as a focus area
- State to develop a new approach that can be applied to lakes across CT
- **Bantam Lake selected as a demonstration project for this effort**



# Why Bantam Lake?

- CT's largest natural lake
- Important public resource for swimming, water skiing, fishing, boating, other recreation
- Affected by nuisance aquatic vegetation
- Summer algal blooms beginning in July or August
- Bottom phosphorus concentration increase as dissolved oxygen decreases



Photo from Bantam Lake Protective Association  
<http://bantamlakect.com/aboutus.html>



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# Why Bantam Lake?

- Strong Partnerships within the Watershed
- Long Term Monitoring Program
- Previous limnologic studies of the lake and watershed
- Public Interest in understanding and improving water quality in the watershed and the lake
- Public comments asking for DEEP to consider Bantam Lake for development of a water quality restoration plan
- EPA Interest in supporting an approach to managing nutrient impacts on lakes



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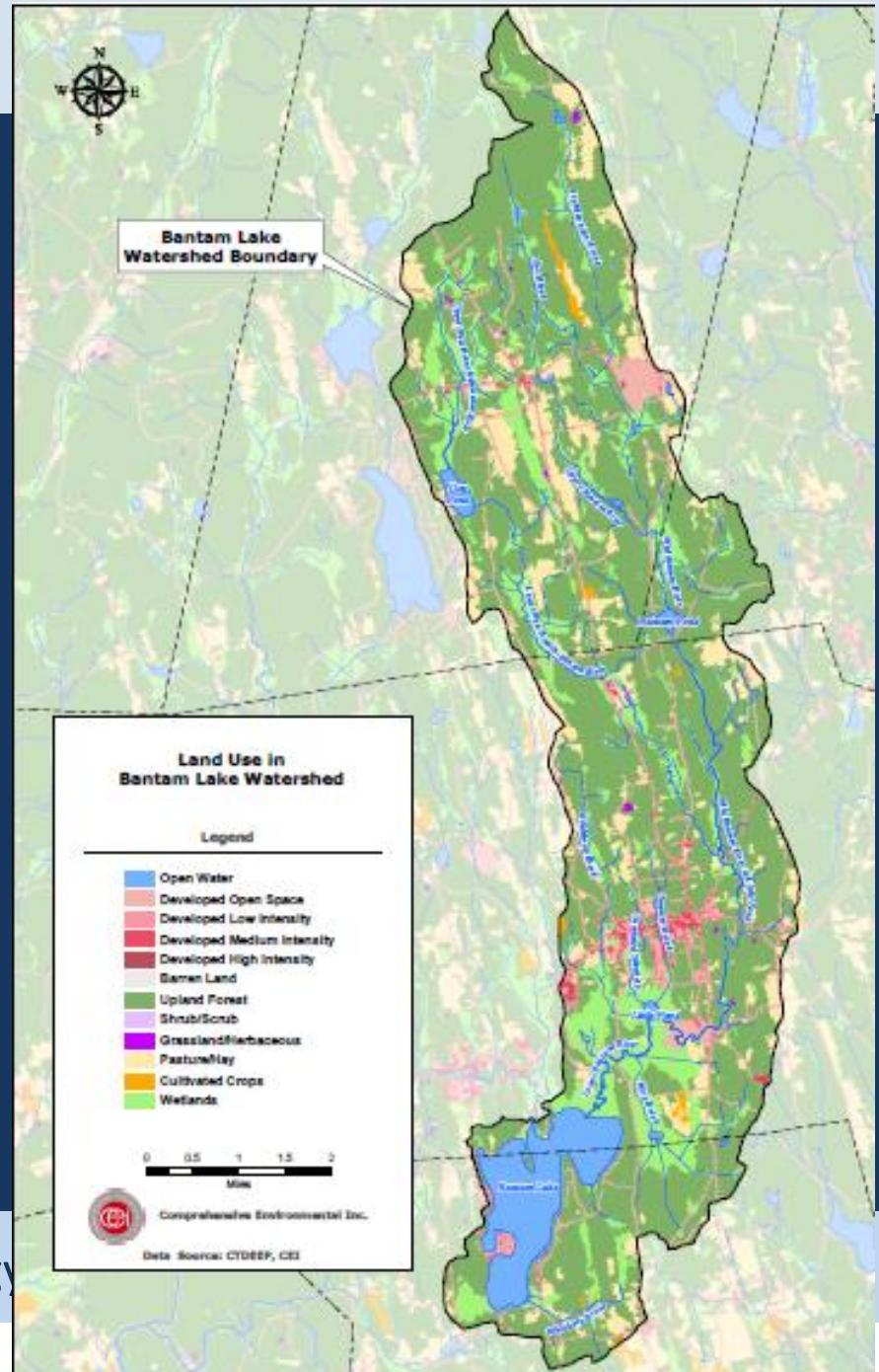
Strong Partnerships and Local Interest means a greater likelihood of implementing projects in the future that will improve water quality and support community goals

# Project Area

Bantam Lake  
and  
contributing  
watershed



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# Project Overview

## Program Development

- Develops an approach to evaluate and manage nutrient loads to CT Lakes
- Improve collaboration between TMDL and Watershed Plan

## TMDL

- Evaluate watershed and water quality
- Set water quality goals
- Provide technical support for implementation activities

## Watershed Based Plan

- Identify specific problem areas for potential BMPs
- Provide education and information to communities
- Creates a flexible plan that will support achieving water quality goals for lake



# General Project Goals

- Identify Water Quality Goal for Lake based on Trophic Level (productivity)
- Reduce frequency of Harmful Algal Blooms
- Facilitate Implementation of actions to restore water quality

## TP, TN:

- causal variables
- spring/summer data

## Chl-a, Secchi disk:

- response variables
- mid-summer data

## CT Water Quality Standards

Trophic State	Parameter	Range
Oligotrophic	Total Phosphorus	0-10 µg/l
	Total Nitrogen	0-200 µg/l
	Chlorophyll- <i>a</i>	0-2 µg/l
	Secchi Disk	6 + meters
Mesotrophic	Total Phosphorus	10-30 µg/l
	Total Nitrogen	200-600 µg/l
	Chlorophyll- <i>a</i>	2-15 µg/l
	Secchi Disk	2-6 meters
Eutrophic	Total Phosphorus	30-50 µg/l
	Total Nitrogen	600-1000 µg/l
	Chlorophyll- <i>a</i>	15-30- µg/l
	Secchi Disk	1-2 meters
Highly Eutrophic	Total Phosphorus	50 + µg/l
	Total Nitrogen	1000 + µg/l
	Chlorophyll- <i>a</i>	30 + µg/l
	Secchi Disk	0-1 meters



# Improve Efficiency

Previous  
Work Flow



- Look for ways to Improve collaboration and integration between TMDL and Watershed Based Plan
- Better link between analysis and implementation
- Standard approach across the state in support of watershed specific solutions
- Provide a resource to facilitate implementation



# New Work Flow

## Core Document

### Bantam Lake

- WBP Addendum

### Appendix 2

- WBP Addendum

Integrate Project  
Elements across all  
related documents

### Core Document

- Contains general information on required elements for TMDLs and Watershed Based Plans
- Includes reference & resource materials to assist implementation

### TMDL Appendices

- Watershed Specific Appendices consistent with TMDL requirements

### WBP Addendums

- Developing Watershed-Based Plan Addendum Template
- Include 9-element components not fully covered in Core document or TMDL Appendix
- Focus on Implementation Activities



# Project Status

Program Development	TMDL	Watershed Plan
<ul style="list-style-type: none"><li>• Identify approach to address issue</li><li>• Secure Resources to develop approach</li><li>• Identify how to set lake management targets</li></ul>	<ul style="list-style-type: none"><li>• Develop models</li><li>• Identify Bantam Lake WQ Targets</li><li>• Run model / Evaluate Scenario</li><li>• Draft TMDL</li><li>• Public Process</li><li>• Finalize</li></ul>	<ul style="list-style-type: none"><li>• Initial Public Outreach</li><li>• Evaluate Sources</li><li>• Identify Potential Implementation Opportunities</li><li>• Draft Plan</li><li>• Public Process</li><li>• Finalize</li></ul>

Done   In Progress   Not Yet Started





# Development of Water Quality Models for Bantam Lake



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# New Watershed Based Approach to Nutrients

- **Objective:**

- Develop a watershed scale approach
- Evaluating nutrient related environmental conditions and sources
- Nitrogen & Phosphorus
- Point and Nonpoint Sources
- Nutrient effects in
  - freshwater watersheds & associated embayments
  - Lakes
- Restoration and Protection

Upland Watershed Model

Downstream Waterbody Model



# Modeling Overview

## Lake Load Response Model

- Calculate Tributary Loading

## BATHTUB

- Calculate In-Lake WQ

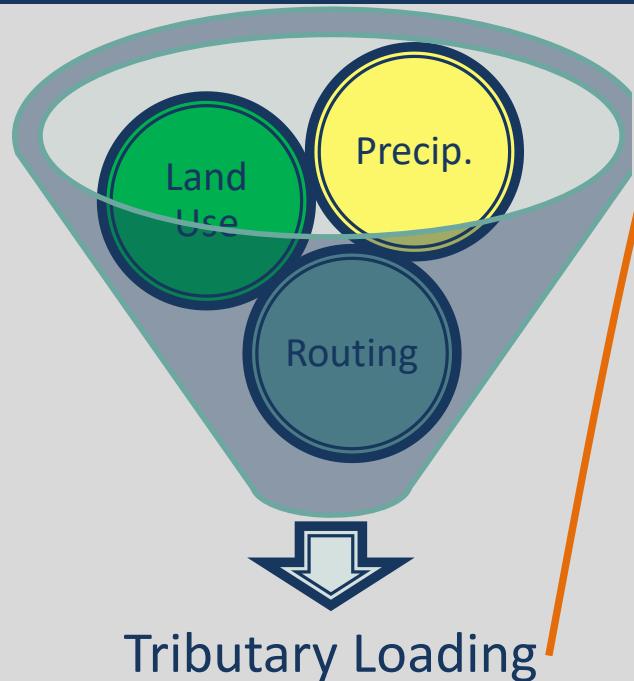
## Load Reduction Analysis

- Determine reductions to meet WQ Targets

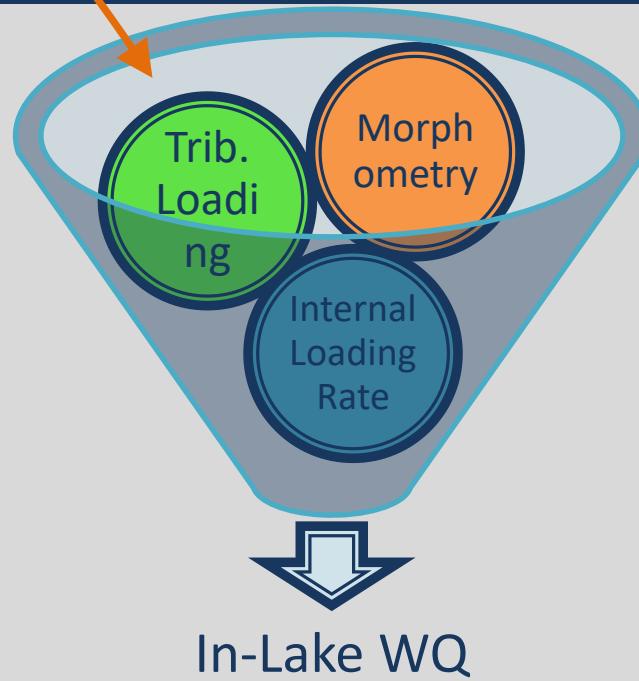


# Modeling Overview

## Lake Loading Response Model



## BathTub



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# What will the model do?

- **Watershed Analysis: Current Conditions**
  - Land Use Contributions
  - Watershed & Tributary Contributions
  - Watershed, Internal & Atmospheric Loads
- **Scenario Analysis: Future Conditions**
  - Provide a tool to analyze various implementation scenarios to identify potential for meeting in lake water quality targets

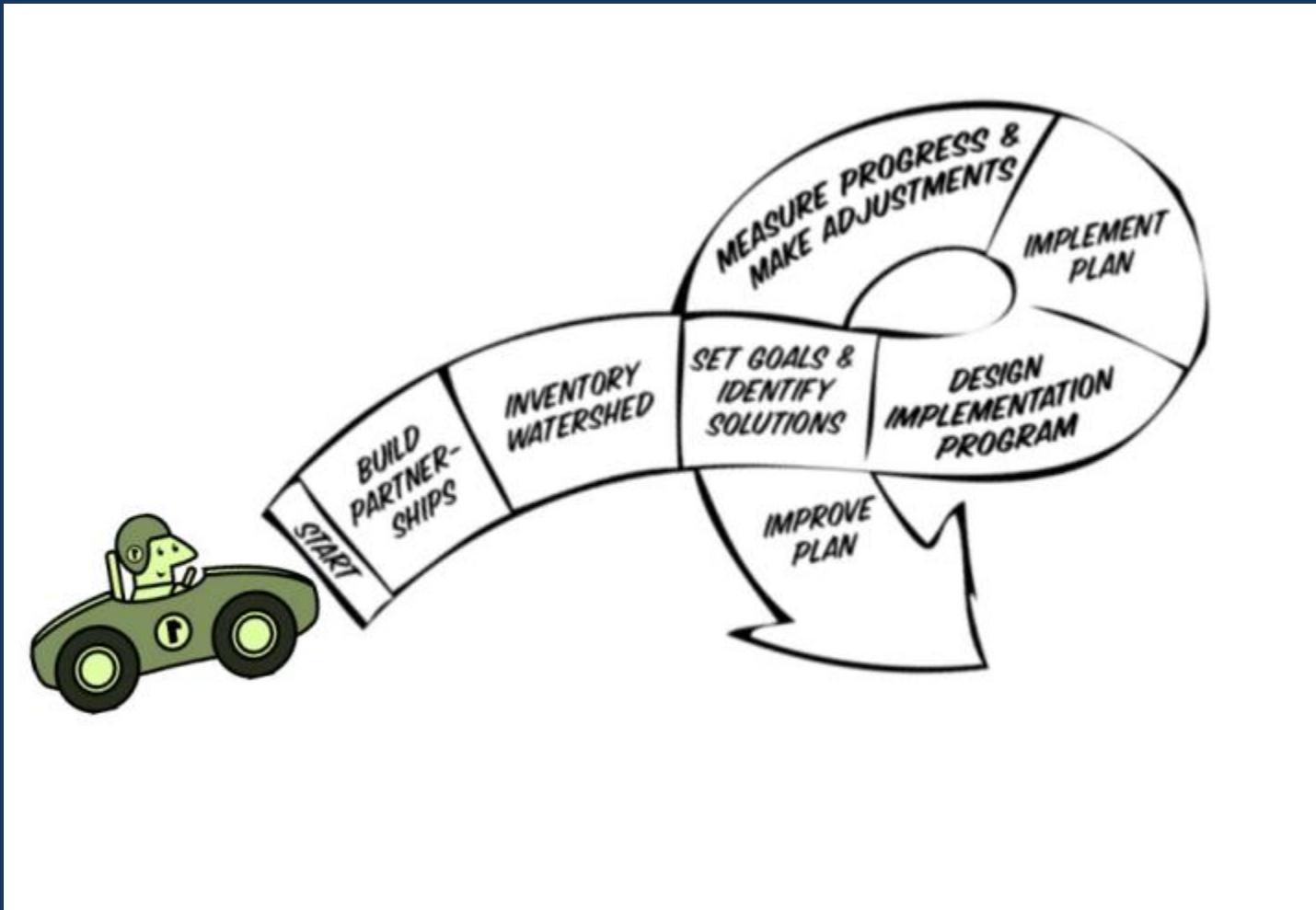


# Watershed Evaluation



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# Watershed Based Planning Process



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# Watershed Evaluation

- Contractor is asking community for information to support watershed evaluation
- Focus on identifying potential sources of nutrients
- Contractor will conduct a field visit
- Will support Best Management Practice Recommendations for voluntary actions



# Community Involvement

- Any help that community could provide to identify potential sources of nutrients in watershed would be appreciated

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# Overview



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# Benefits to Communities

- Provides a holistic view of the watershed connecting the watershed and lake
- Improved water quality in watershed and lake
- Improve recreational opportunities for community
- State and federal support via funding and staff resources benefit community
- Provides a tool for community-based action

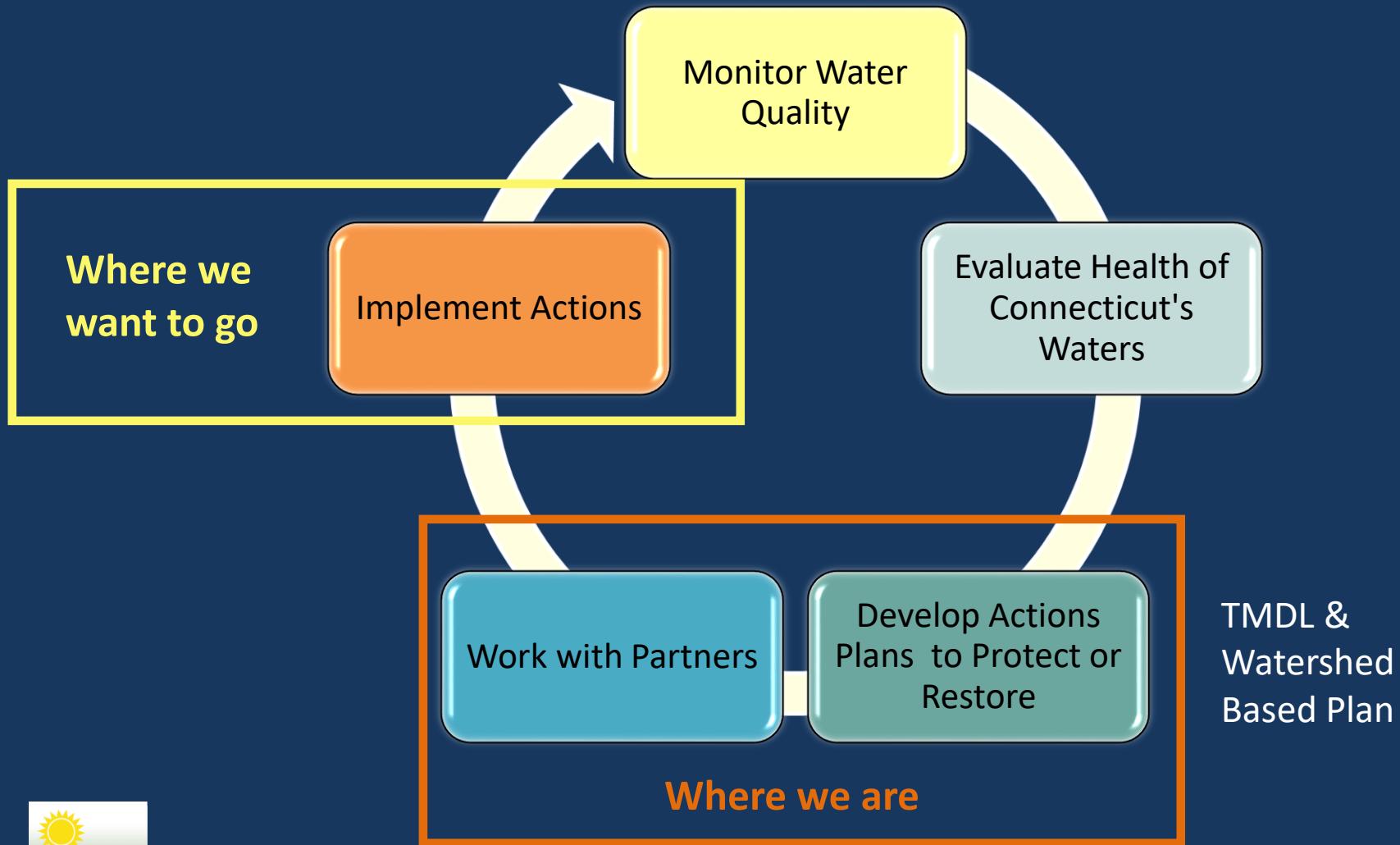


# Benefits to Communities

- Incorporates work previously done by the community
- Provides a platform collaboration between towns, community groups, residents, etc.
- Supports future funding requests by community partners under other grant programs



# Project Overview



# Thank You

- Thank you to those who have:
  - funded water quality Bantam Lake studies and monitoring
  - Worked to improve Bantam Lake for the community
  - Offered assistance to us through this current project



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## Other Watershed Partners



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# Project Contacts

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