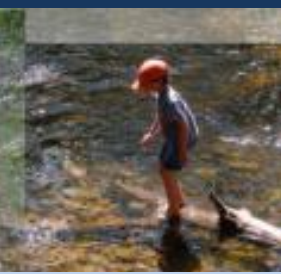




Connecticut Department of Energy and Environmental Protection



Connecticut Department of
**ENERGY &
ENVIRONMENTAL
PROTECTION**

Addressing Nutrients in CT Lakes: Bantam Lake Project

May 13, 2020

CTDEEP Presentation

Teleconference with Local Stakeholders



Connecticut Department of Energy and Environmental Protection

Agenda

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

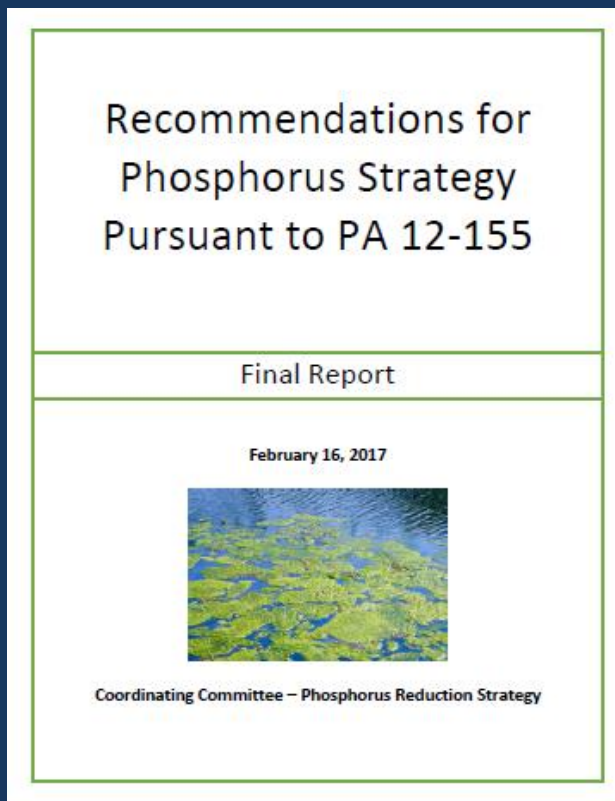


Presentation Objectives

- 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?



Integrated Water Resource Management

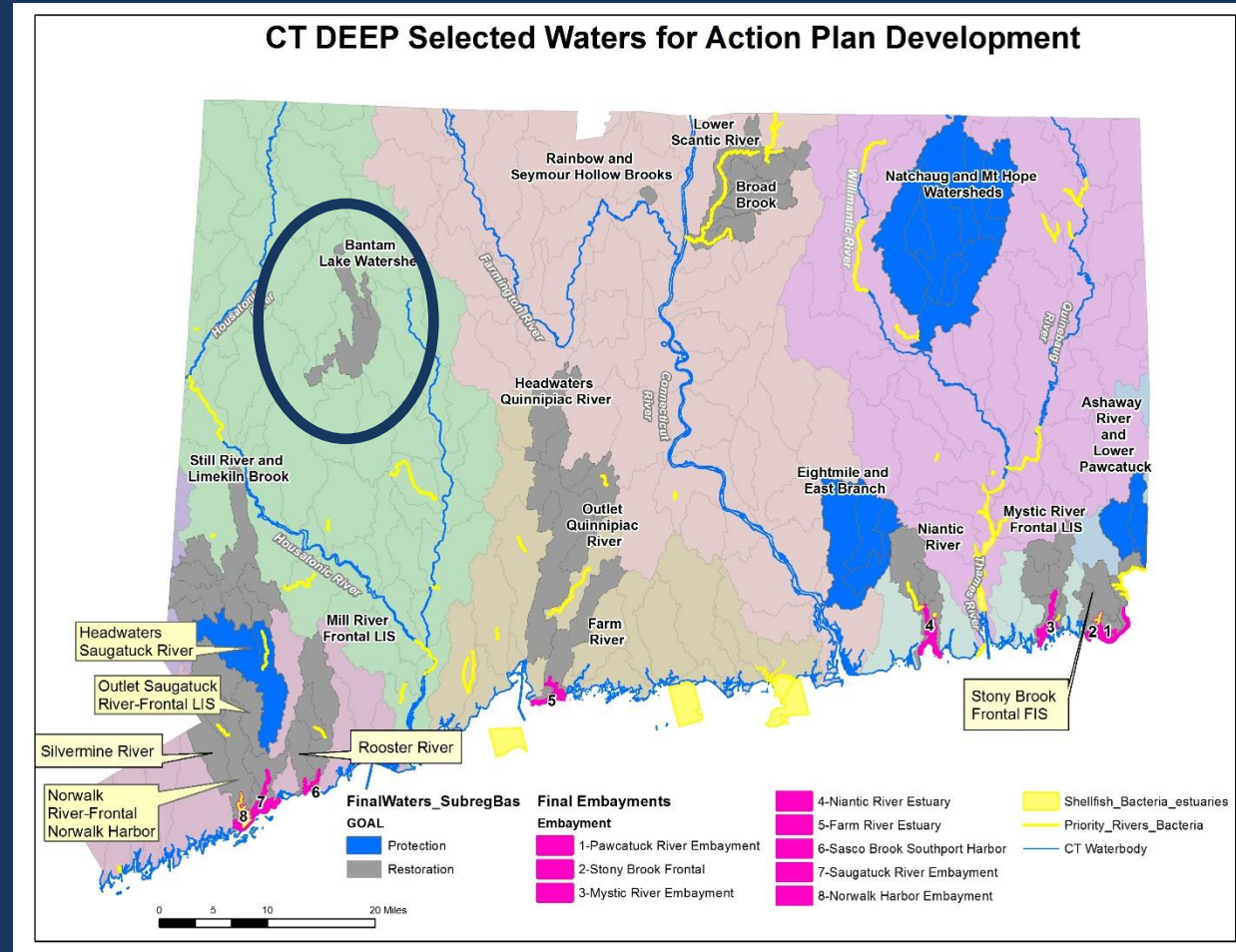
Both efforts include a focus on nutrients and recommend that approaches be developed to address impacts on lakes



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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

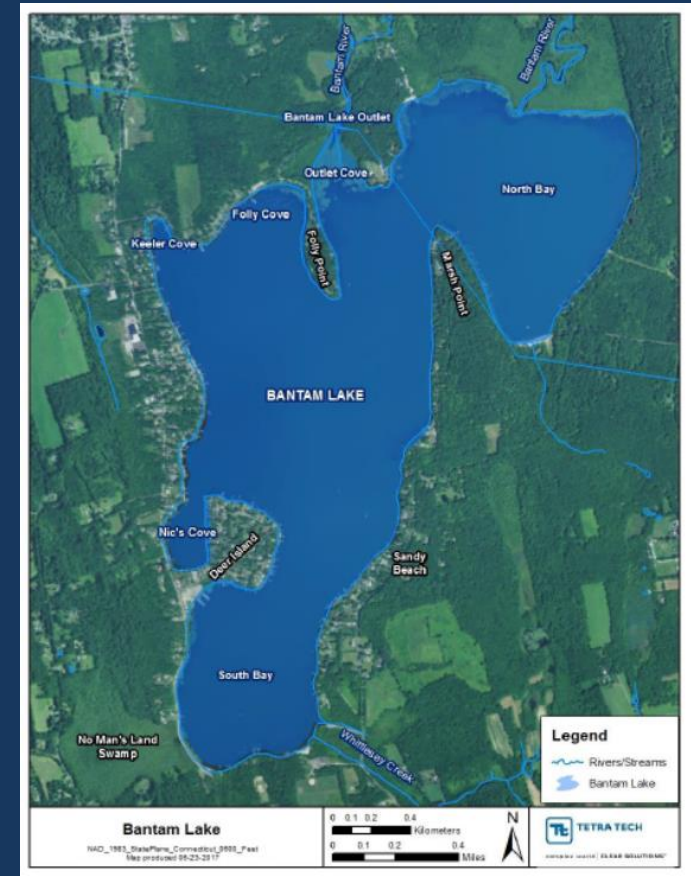
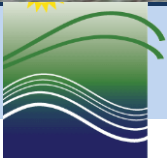


Photo from Bantam Lake Protective Association
<http://bantamlakect.com/aboutus.html>



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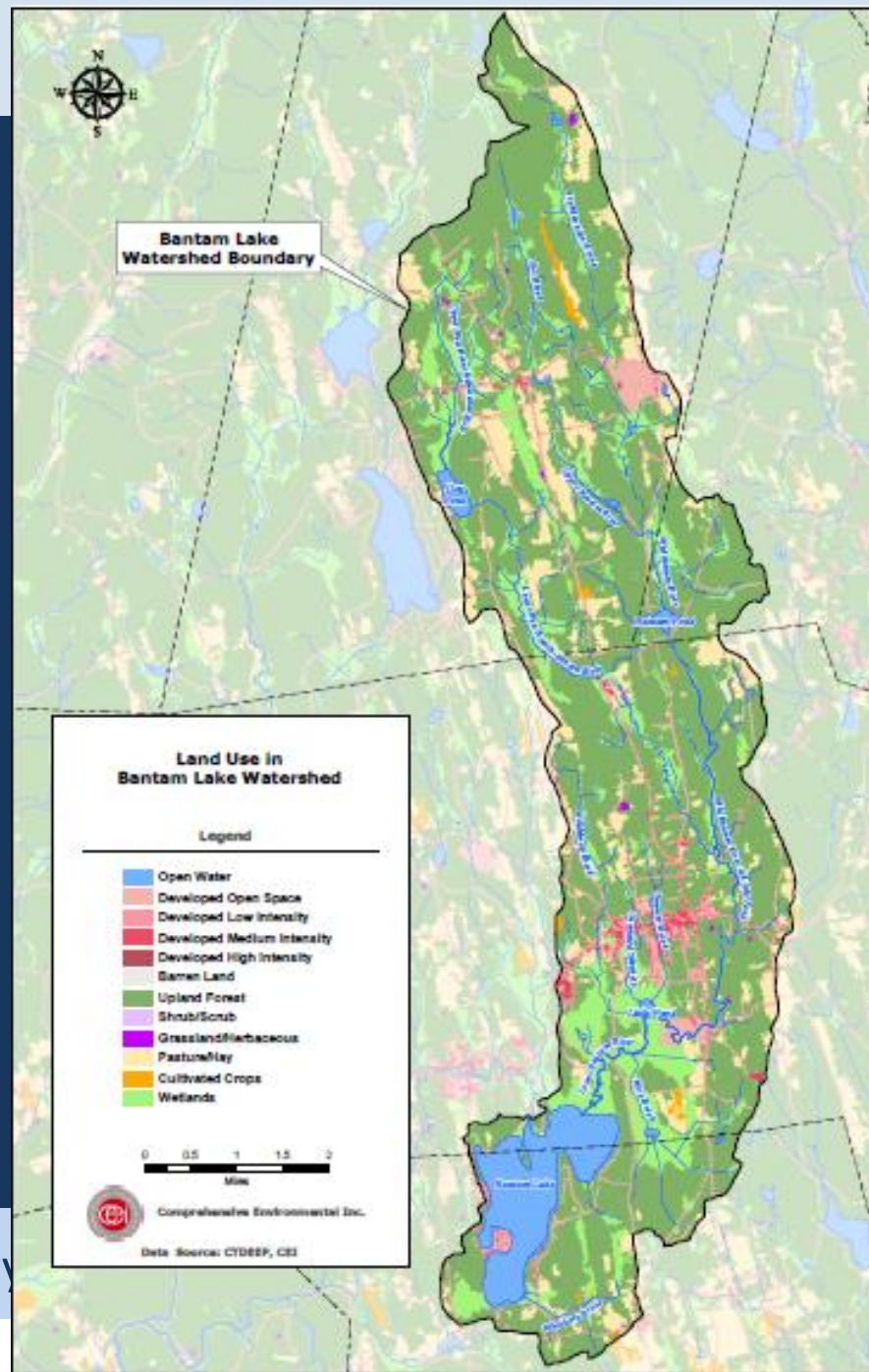
Strong Partnerships and Local Interest means a greater likelihood of implementing projects in the future that will improve water quality and support community goals



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Project Area

Bantam Lake and contributing watershed



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



- 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

- Identify approach to address issue
- Secure Resources to develop approach
- Identify how to set lake management targets

TMDL

- Develop models
- Identify Bantam Lake WQ Targets
- Run model / Evaluate Scenario
- Draft TMDL
- Public Process
- Finalize

Watershed Plan

- Initial Public Outreach
- Evaluate Sources
- Identify Potential Implementation Opportunities
- Draft Plan
- Public Process
- Finalize

Done

In Progress

Not Yet Started





Development of Water Quality Models for Bantam Lake

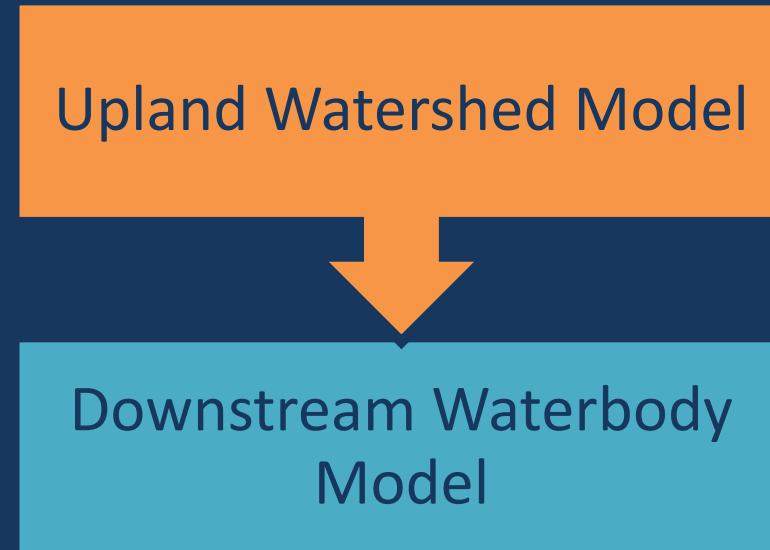


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New Watershed Based Approach to Nutrients

- **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



Modeling Overview

Lake Load Response Model

- Calculate Tributary Loading

BATHTUB

- Calculate In-Lake WQ

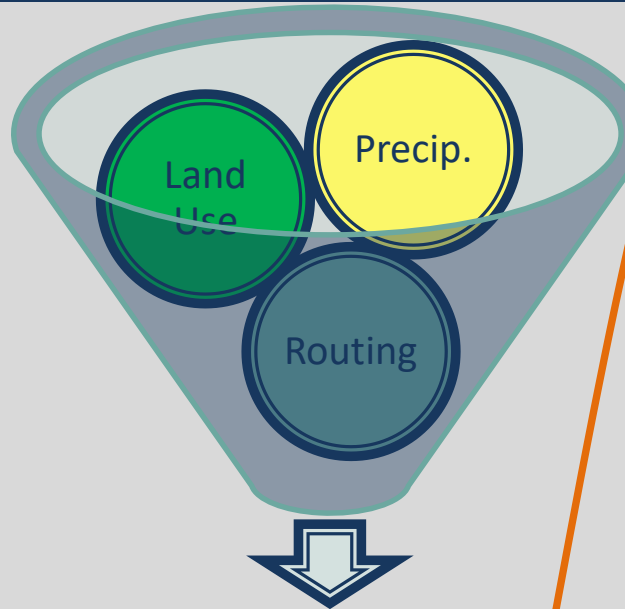
Load Reduction Analysis

- Determine reductions to meet WQ Targets



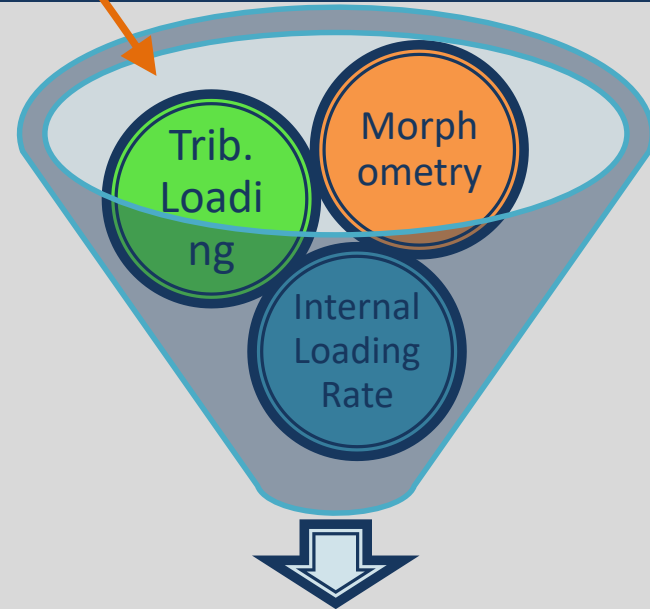
Modeling Overview

Lake Loading Response Model



Tributary Loading

BathTub



In-Lake WQ



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



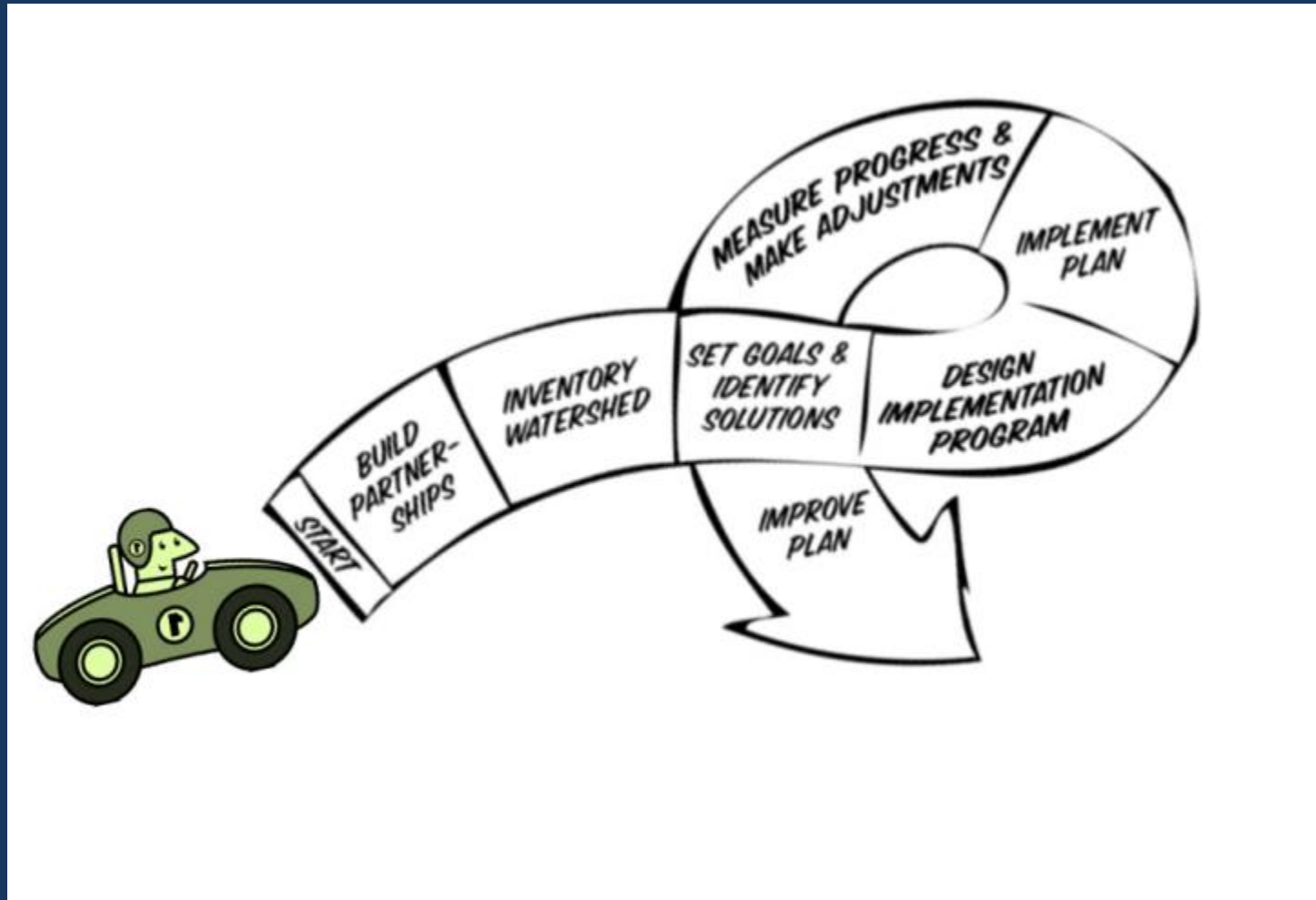


Watershed Evaluation



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Watershed Based Planning Process



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

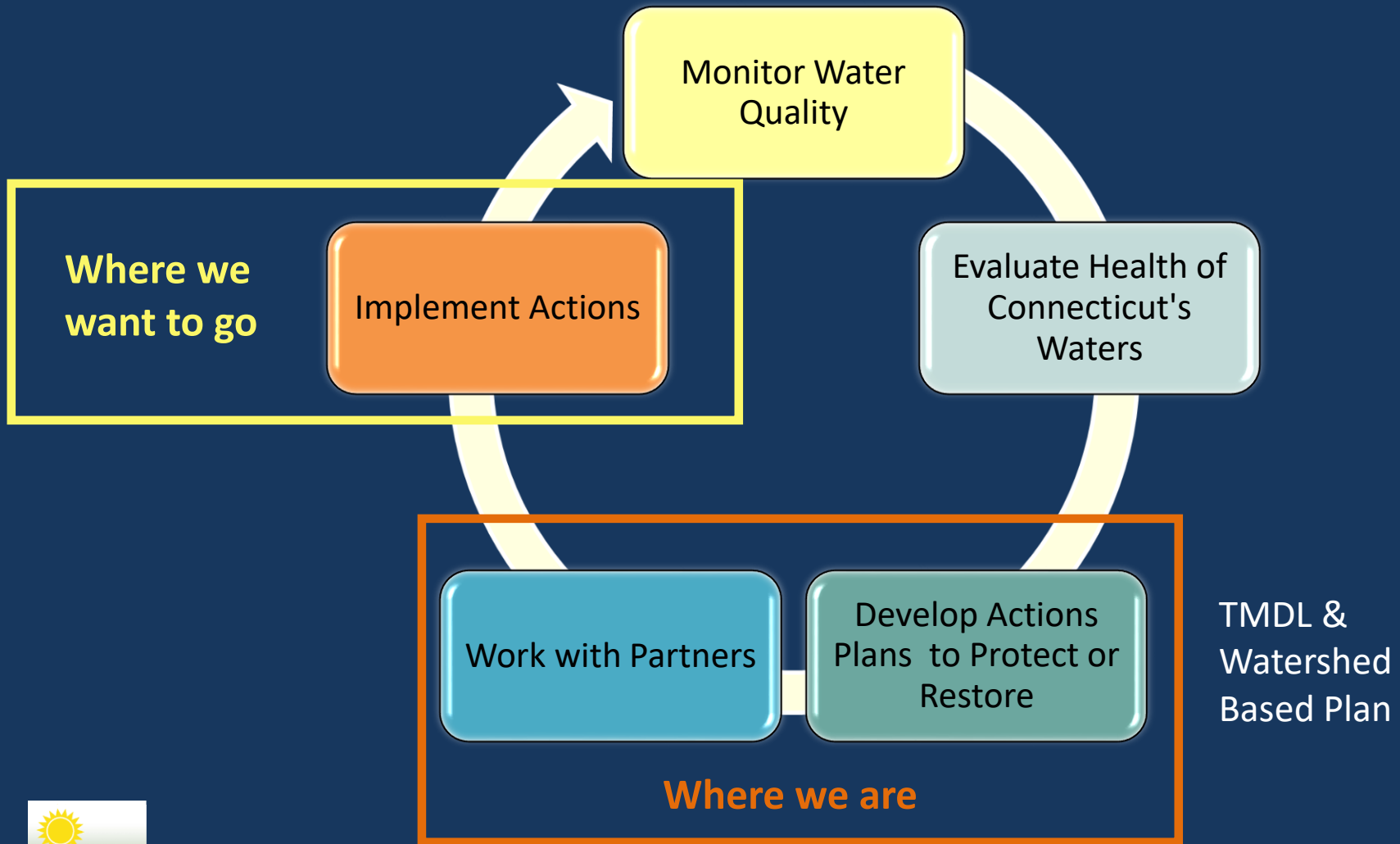


Benefits to Communities

- 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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