Bantam Lake Watershed Based Plan Project

Summary of Project Kickoff Webinar
May 7, 2020

A kick-off meeting for the Bantam Lake Watershed Based Plan Project was held on May 7, 2020 from 1-3 pm via Zoom. The meeting goals were to provide stakeholders with background on the project, including the results of the Bantam Lake Modeling project completed in February 2020, and to solicit input regarding potential sources of phosphorus or sediment pollution in the Bantam Lake Watershed.

The next step for this project is to use information collected from stakeholders on potential watershed pollutant sources as well as information from a desktop analysis to guide a watershed field assessment during May-June 2020. The overall project should be completed by December 2020.

Participants

Town of Morris First Selectman – Tom Weik
Town of Litchfield WWTP Superintendent – Ted Donoghue
Town of Goshen DPW Supervisor – Garret Harlow
Town of Goshen Inland Wetlands and Water Courses Commission Clerk – Tom Stansfield
City of Litchfield Assistant Planner and Inland Wetlands Officer – Jeremy Leifert
City of Litchfield City Planner – Martin Connor
City of Litchfield Deputy Public Works Director – Paul Kundzins
Litchfield Land Trust – Dean Birdsall
Morris Land Trust Director – Ben Solnit
Bantam Lake Protective Association President – Constance Trolle
White Memorial Foundation; White Memorial Conservation Center Research Director – James Fischer
Housatonic Valley Association Watershed Conservation Director – Mike Jastremski
Housatonic Valley Association Conservation Projects Manager – Lindsay Larson
Housatonic Valley Association Conservation Projects Manager – Courteny Morehouse
Northwest Conservation District Executive Director – Cynthia Rabinowitz
UConn Extension Educator/University Specialist – Richard Meinert
Steve Winnett – EPA Region 1
Susan Peterson – CT DEEP
Erik Bedan – CT DEEP
Traci Iott – CT DEEP
Matt Goclowski – CT DEEP
Ed Machowski– CT DEEP
Darcy Winther– CT DEEP
Daniel Imig– CT DEEP
Adam Fox– CT DEEP
Elizabeth Clark– CT DEEP
Rebecca Jascot– CT DEEP
Msengi Mgonella– CT DEEP
Diane Jorsey– CT DEEP
Kimberly Lesay– CT DEEP
Eric Thomas– CT DEEP
Chris Malik– CT DEEP
Phil Trowbridge– CT DEEP
Viola Gerveni– CT DEEP
Antoanela Daha– CT DEEP
Morgan DuBois– CT DEEP
Allan Dodge– CT DEEP
CEI Staff: Bob Hartzel, Emily DiFranco, and Dave Roman

Agenda

1. Introductions
2. Summary of Bantam Lake Modeling Results (see attached PowerPoint slides)
3. Overview of Bantam Lake Watershed Based Plan Project (see attached PowerPoint slides)
4. Brainstorming for Watershed Field Assessment

Summary of Potential Sources of Pollution in the Bantam Lake Watershed

The next step in this process is to conduct a field assessment to identify sources of pollution in the Bantam Lake watershed and recommend appropriate Best Management Practices (BMPs) to address these sources. As summarized below, stakeholders provided suggestions and information regarding locations to evaluate during the field assessment. ***Stakeholders are encouraged to contact Emily DiFranco of CEI (edifranco@ceiengineers.com) with additional information in support of the field assessment.***

Ben Solnit – Morris Land Trust

- Litchfield Country Club – how do they manage their grass? The Country Clun abuts the Bantam River just upstream of Little Pond
- Palmer Road between Route 209 and Deer Island – frequent flooding up onto lawn and over part or all of road
- Septic systems on the lake shore, particularly those owned by White Memorial on the north shore of the lake
- Culvert on Route 209, approximately a quarter mile before junction with Route 109 connecting wetland and South Bay – often floods road
- Arethusa Farm – large dairy farm on Route 63 in Litchfield- uses a company called Eager Earth to recycle their manure
- I-2 Systems – small factory on Route 209 that makes LED lights
- Small farm on North Lake Street in Litchfield (north of 202 towards Little Pond) - crops and cattle

James Fischer – White Memorial Foundation

- Inspect culvert on Route 209 adjacent (to the west) of South Bay
- Watershed boundary on western side of the lake needs to be adjusted to include Route 209.

Ed Machowski – CTDEEP Fisheries

- Area north of Little Pond behind Ocean State Job Lot (South of Route 202) – high levels of conductivity in this area
- Brandywine Assisted Living – no stormwater catch basins on the east side of Constitution Way

Tom Weik – Town of Morris

- Old Litchfield Sewer Beds near Whites Wood Road and Bissell Road (to the east)

Chris Malik – CT DEEP

- Uncovered/unstabilized stockpiles of stone and dirt piles, on west side of Russell Street (Litchfield Highway Department facility)

Matt Goclowski – CT DEEP Fisheries

- Some culvert assessment information may be available through the North Atlantic Aquatic Connectivity Collaborative: https://www.naacc.org/naacc_data_center_home.cfm

Susan Petersen – CT DEEP

- Historically, CT DEEP has focused efforts on larger onsite wastewater locations. Confirm if Connecticut Junior Republic system has been upgraded in recent years. (*Tom Stansfield to confirm this*)

Tom Stansfield – Town of Goshen Inland Wetlands and Water Courses Commission Clerk

- Have conducted onsite sanitary surveys of the White Memorial Foundation property septic systems.
- Torrington has digitized septic system data by address

Cynthia Rabinowitz – Northwest Conservation District Executive Director

- Horse farms and hobby farms throughout watershed – manure management on these properties
- Homeowner landscaping choices could be a focus of educational efforts, such as promoting Low Impact Development stormwater management and less use of fertilizers. (*HVA has some educational materials that could be used*).

Garret Harlow – Town of Goshen Supervisor of Public Works

- Dirt road stream crossing on Town Hill Road off of Beach Street in Goshen

Ted Donoghue – Town of Litchfield WWTP Superintendent

- Severe bank erosion abutting the Litchfield Golf Course on the east side across from the Town Community Field located off of Route 63 in Litchfield. Moderate erosion on the other side of this location, east of Route 63 heading north as well.
- Forman School property abuts the Bantam River just north of the Litchfield Borough.
- Sewer line that runs north to south along the Bantam River starting at Route 118 south toward, and through the Litchfield Golf Course. At some points, it comes 75-100 feet of the river. We have not had an SSO in this area in more than seven years.
- Major DOT culvert that drains down from Route 63 located at 339 South Street in Litchfield to the Bantam River. The culvert crosses the sewer line.
- Generally, do not have sewer lines exfiltrate into the ground – normally infiltration occurs from ground to sewer lines.

Bantam Lake
Watershed-Based Plan Project

Webinar:
May 7, 2020

Webinar Agenda

1. Introductions

2. Summary of Bantam Lake Modeling Results

3. Overview of Watershed Based Plan (WBP) Project

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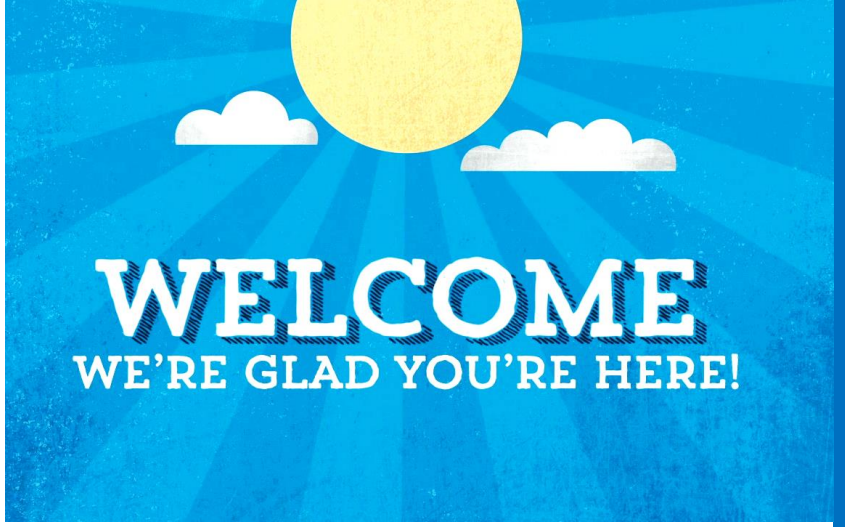
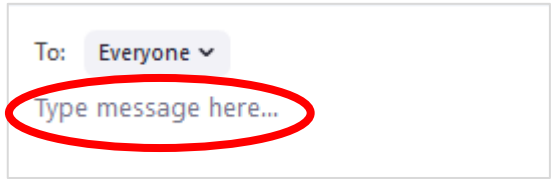
4. Brainstorming for Watershed Field Assessment
    - *Stakeholder Input Needed*

Introductions



1. Click "Chat" on banner at bottom screen

2. Type name and organization (chat box at lower right corner of screen)



3. Use chat to ask questions during presentation…group Q&A at end of presentation

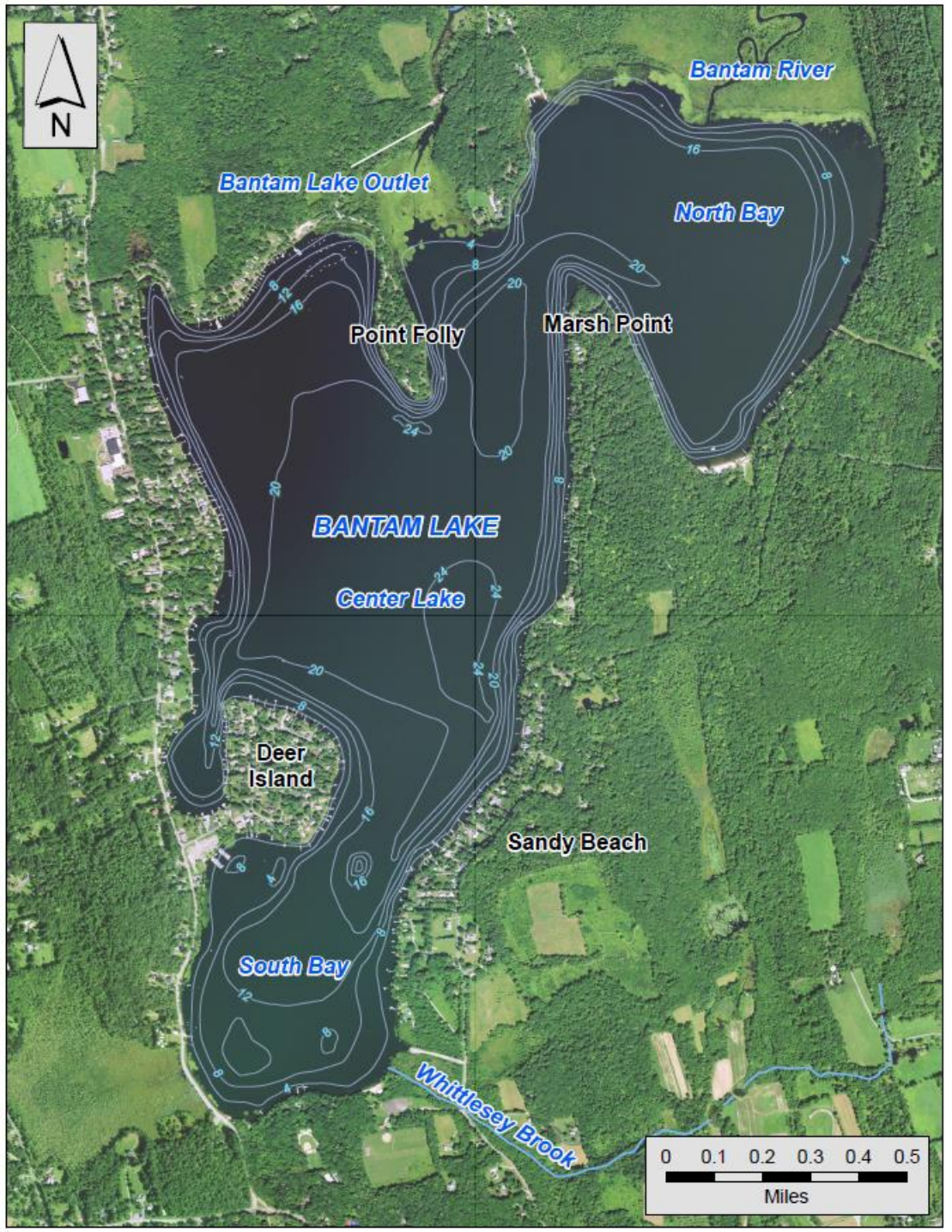
Project Background

- **Excess nutrients can contribute to eutrophication and Harmful Algal Blooms (HABs)**
- **CT DEEP & EPA are developing a statewide nutrient TMDL for lakes**
- **TMDL will include watershed-specific appendices for each lake…Bantam Lake is the first!**

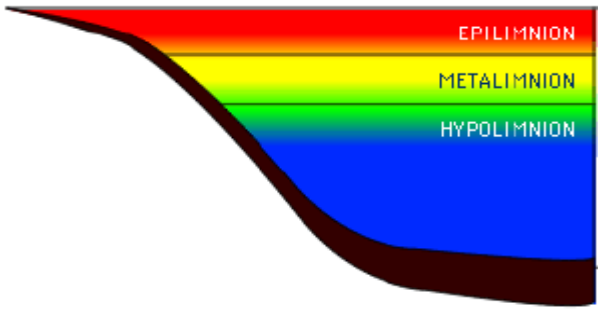
Bantam Lake cyanobacteria bloom, August 2016

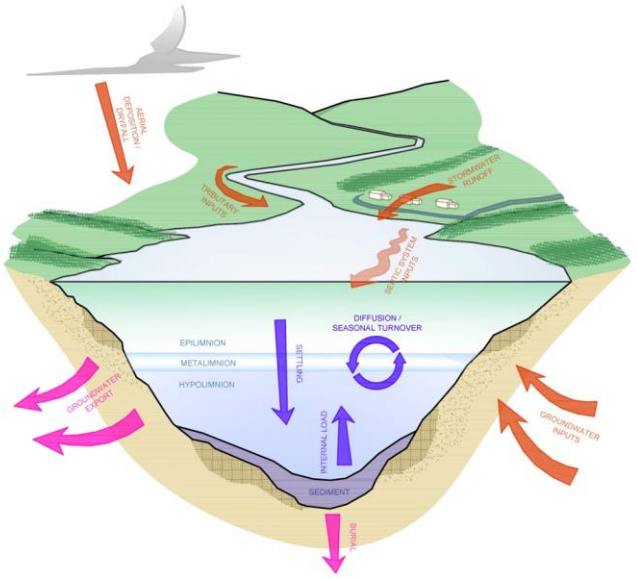
Background

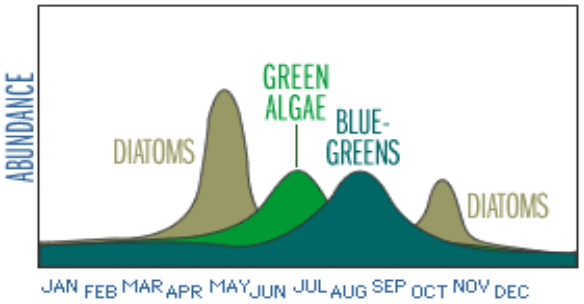
- **Bantam Lake is state-listed as impaired (recreational use) due to:**
  - **algae**
  - **chlorophyll-*a***
  - **nutrients**
- **Bantam Lake Nutrient TMDL Modeling project completed (Feb. 2020) to support TMDL and watershed planning**



Summary of Bantam Lake Modeling Results





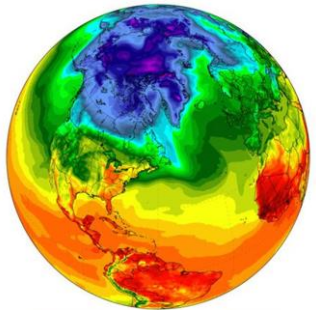


Lake Trophic Classes

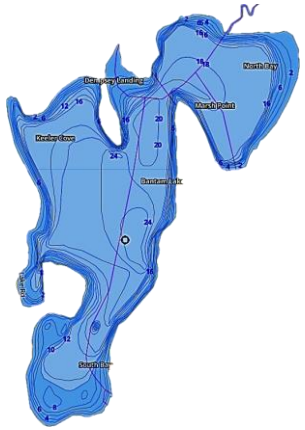
EUTROPHICATION: The natural process by which nutrients, organic matter and sediments gradually accumulate within a water body, resulting in decreased depth and increased biological productivity.

Three Primary Factors Regulating Trophic State

1. Rate of Nutrient Supply



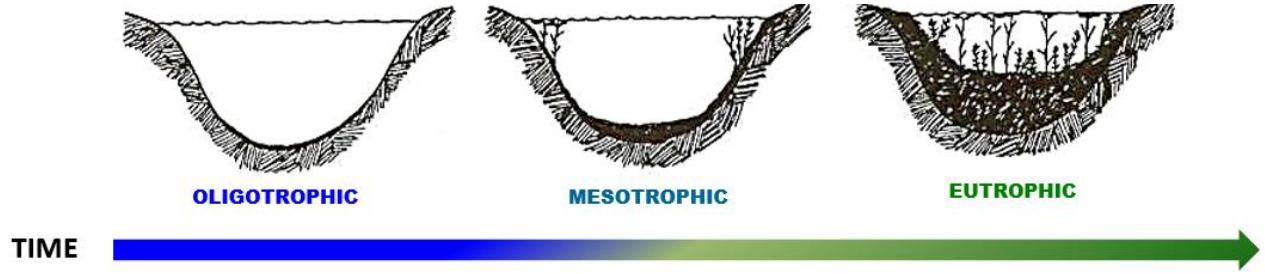
2. Climate

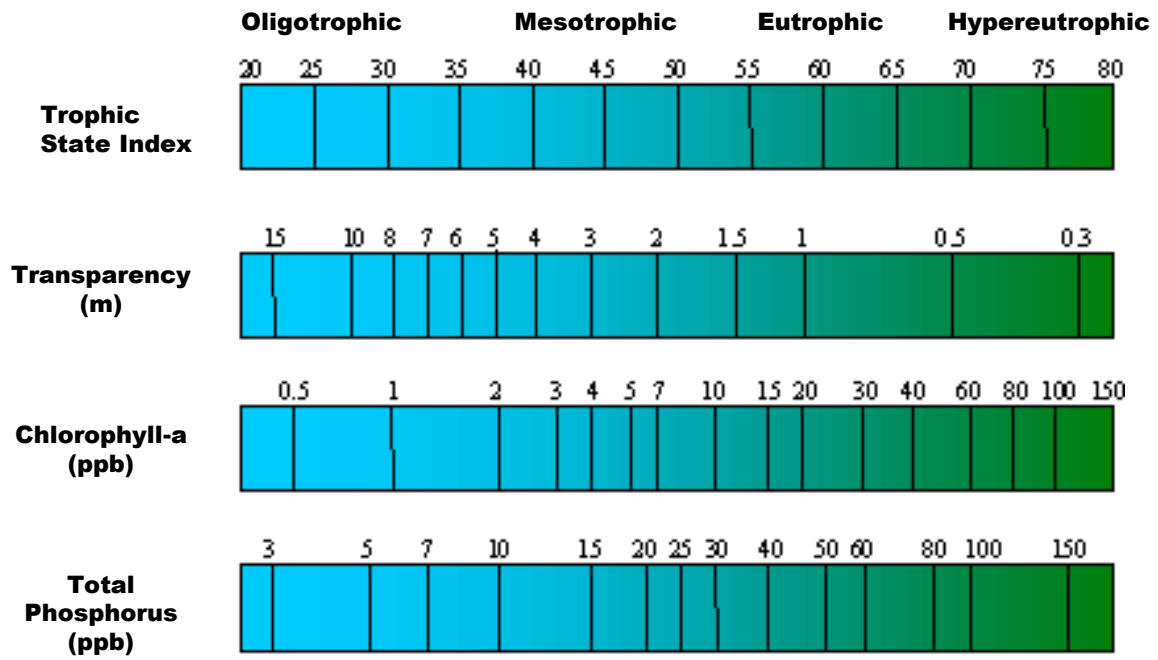


3. Shape of Lake Basin

- Depth
- Volume / Surface Area
- Watershed to Lake Area Ratio

Carlson Trophic Status Index (TSI)





Each 10 point TSI increase = doubling of phosphorus, 2.8 fold increase in algal biomass

CT Trophic State Categories

TP, TN:

- causal variables

Chl-a, Secchi disk:

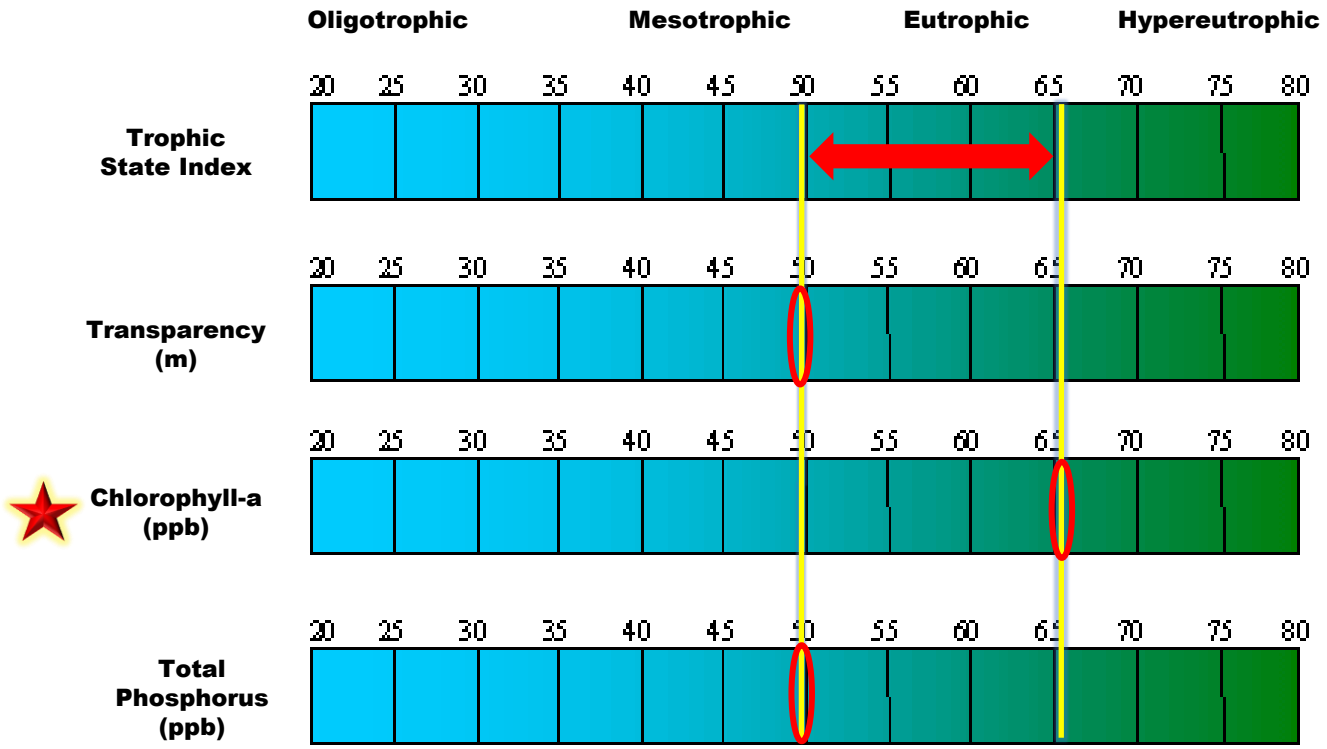
- response variables

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

Bantam Lake Trophic Status

** Only 4 chl-a measurements…insufficient data to have confidence in results*

Carlson TSI Range = 49.3 - 66



Water Quality Goals

Setting Water Quality Targets

The Goldilocks Approach

1. **Too Extreme: goal not realistically attainable**
   (e.g., would require no development in watershed)

2. **Not Protective Enough: goal is achievable but may not prevent water quality impairments**
   (e.g., algae blooms).

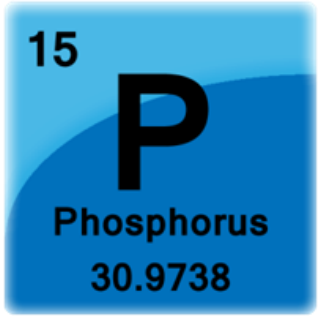
3. **Just Right: goal is both realistically attainable and will achieve WQ standards (de-listing)**

Bantam Lake – Water Quality Targets

- "Natural" trophic status of Bantam Lake defined as "**upper range mesotrophic**"
- Targets are **upper third** for each parameter

Trophic State		Range	Bantam Lake Target Range
Mesotrophic	TP	10-30 µg/l	23-30 µg/L
	TN	200-600 µg/l	467 – 600 µg/l
	Chl-*a*	2-15 µg/l	10.7 – 15.0 µg/l
	Secchi	2-6 m	2 – 3.3 m *(mid-summer)*

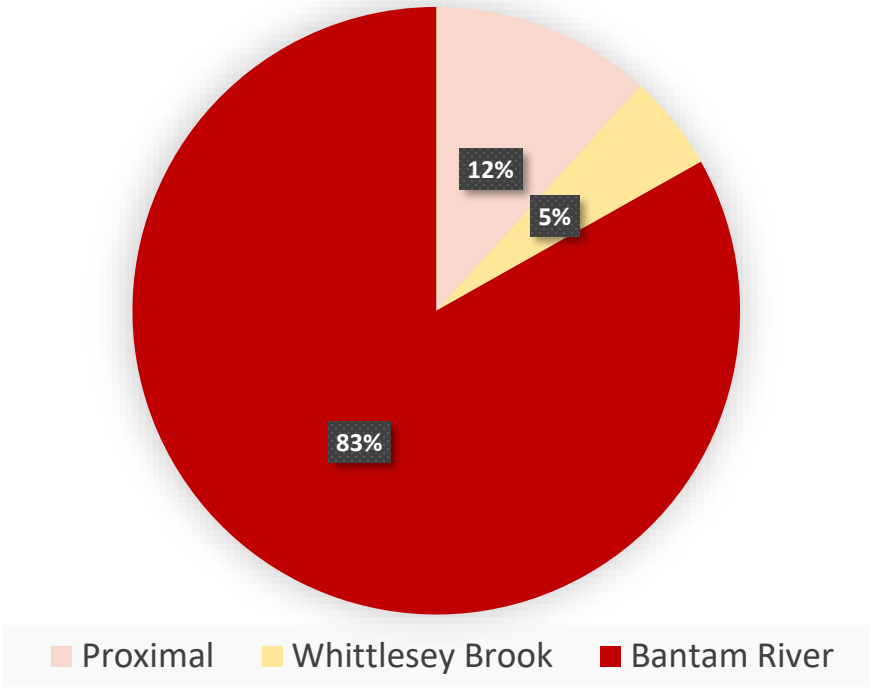
Where do the nutrients come from in the Bantam Lake watershed?



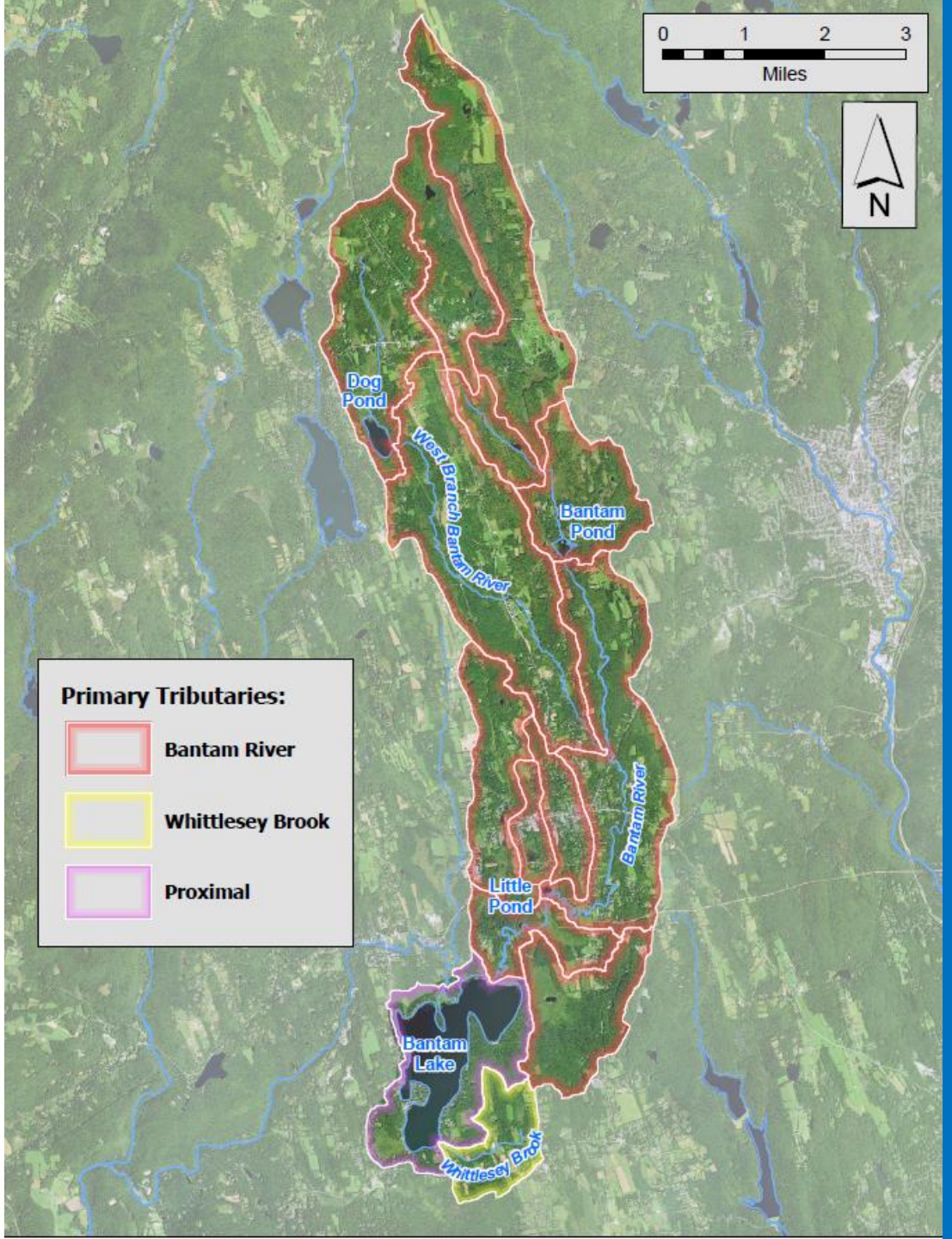
Watershed Loading Results

***Estimated Total Phosphorus Load = 1,004 kg/yr**

By Major Tributary

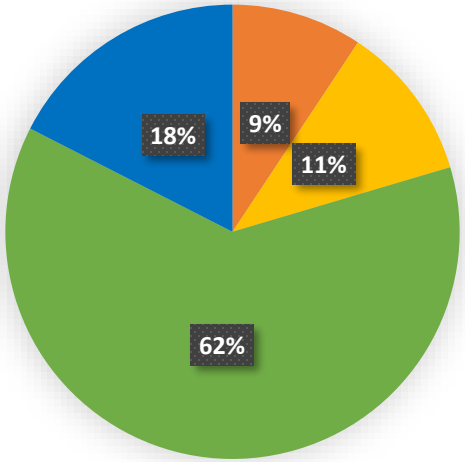


**estimate from averaging period – April through October*



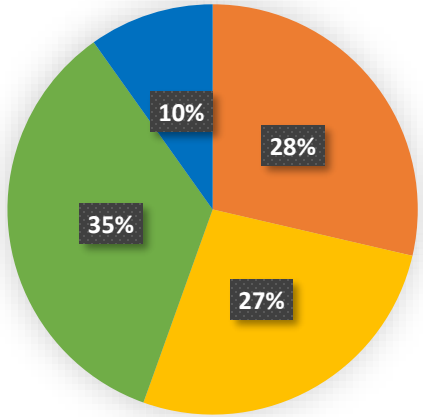
Land Uses -Bantam Lake Watershed

Area by Land Use Category

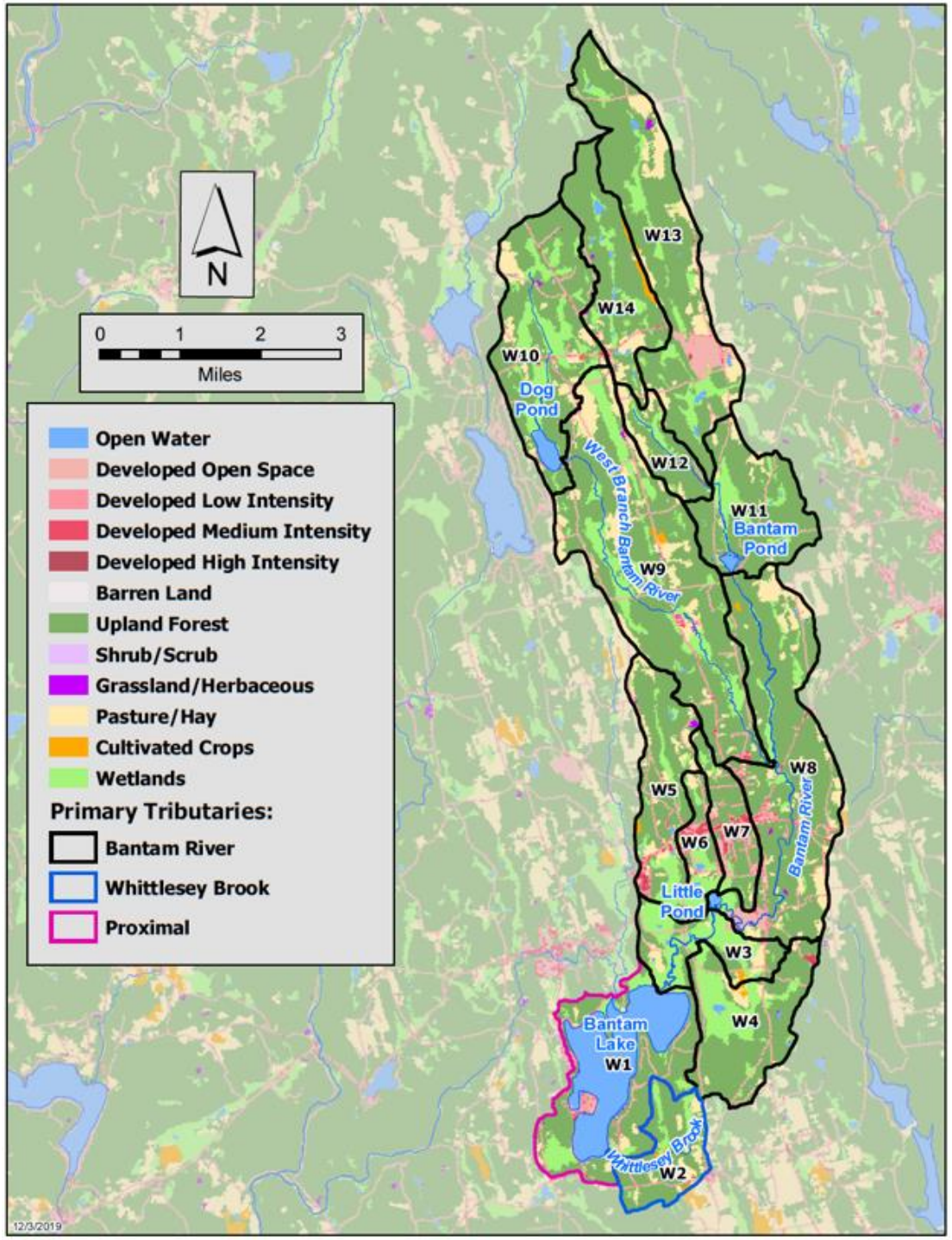


Urban Agriculture Forest Wetland / Other

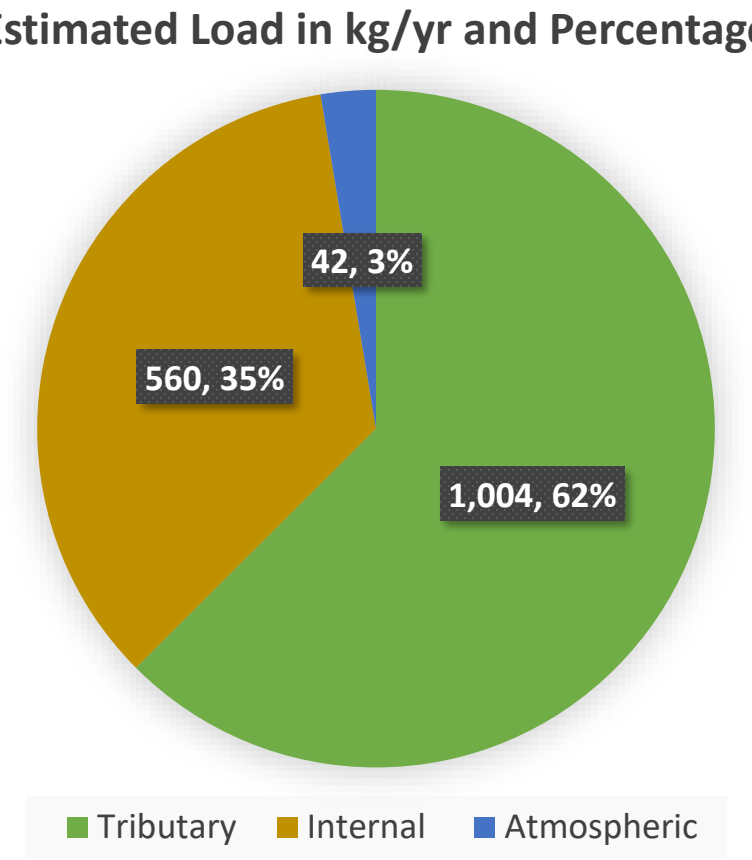
Estimated Loads By Land Use Category



Urban Agriculture Forest Wetland / Other

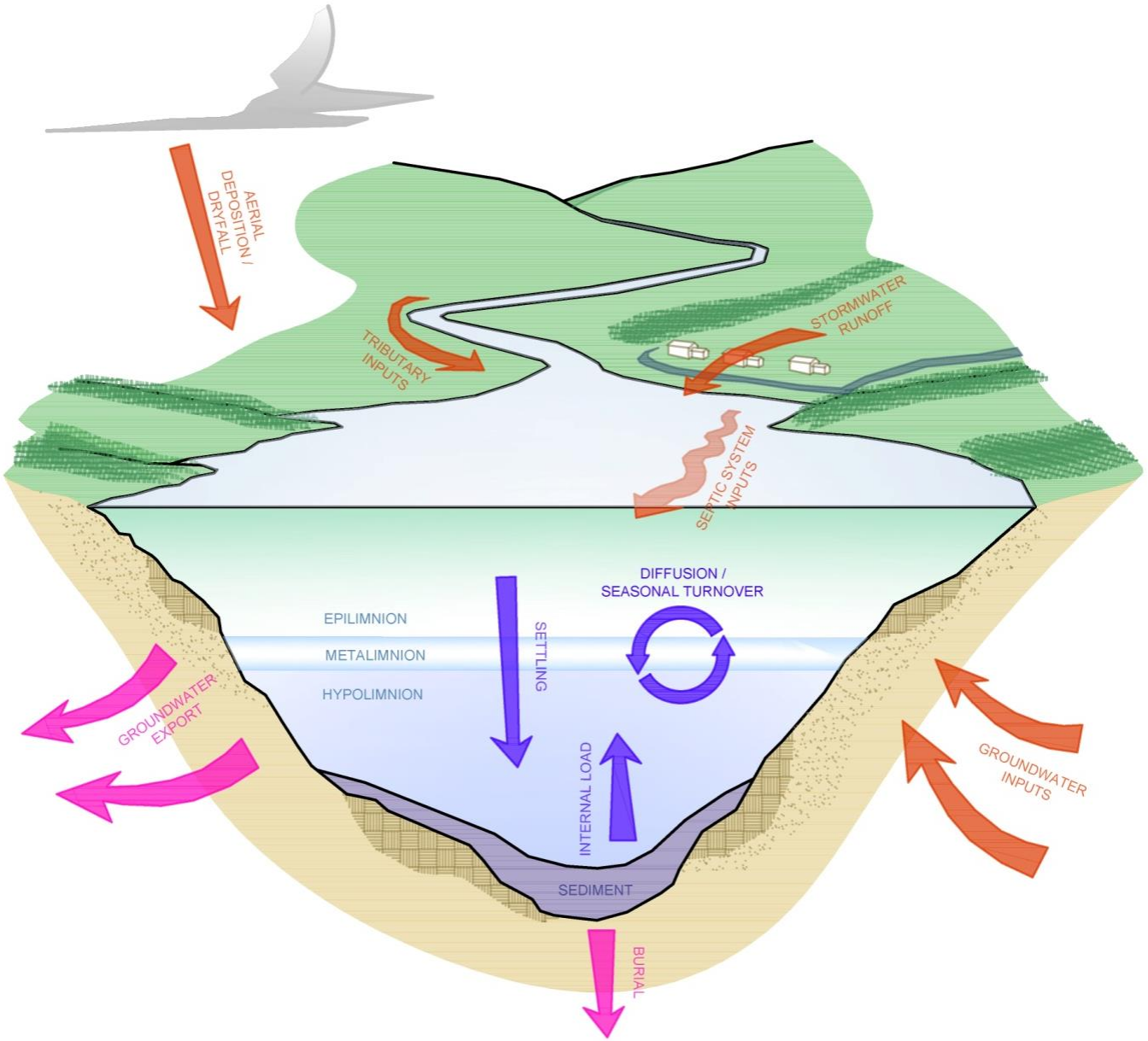


Estimated Load by Source

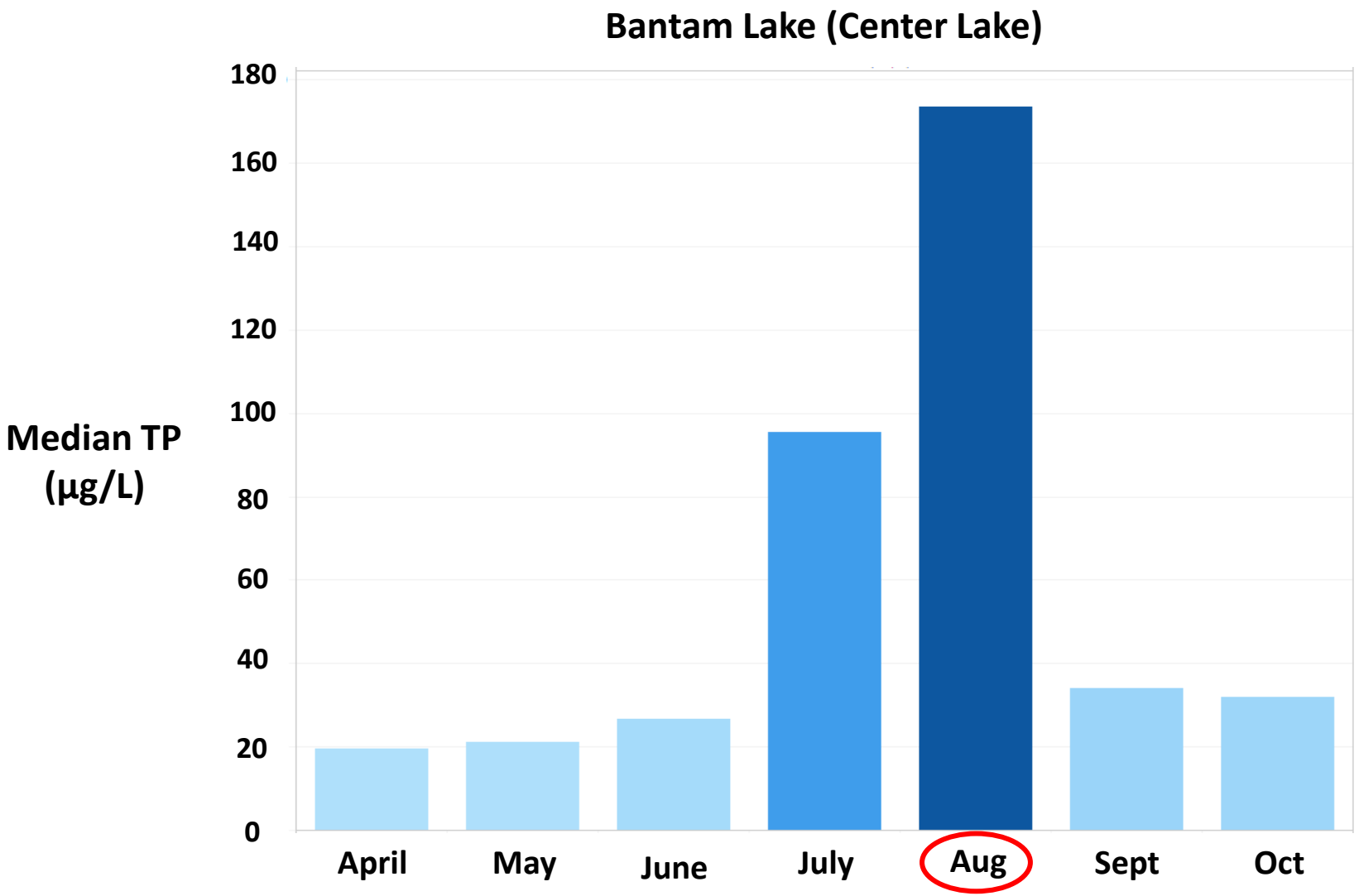


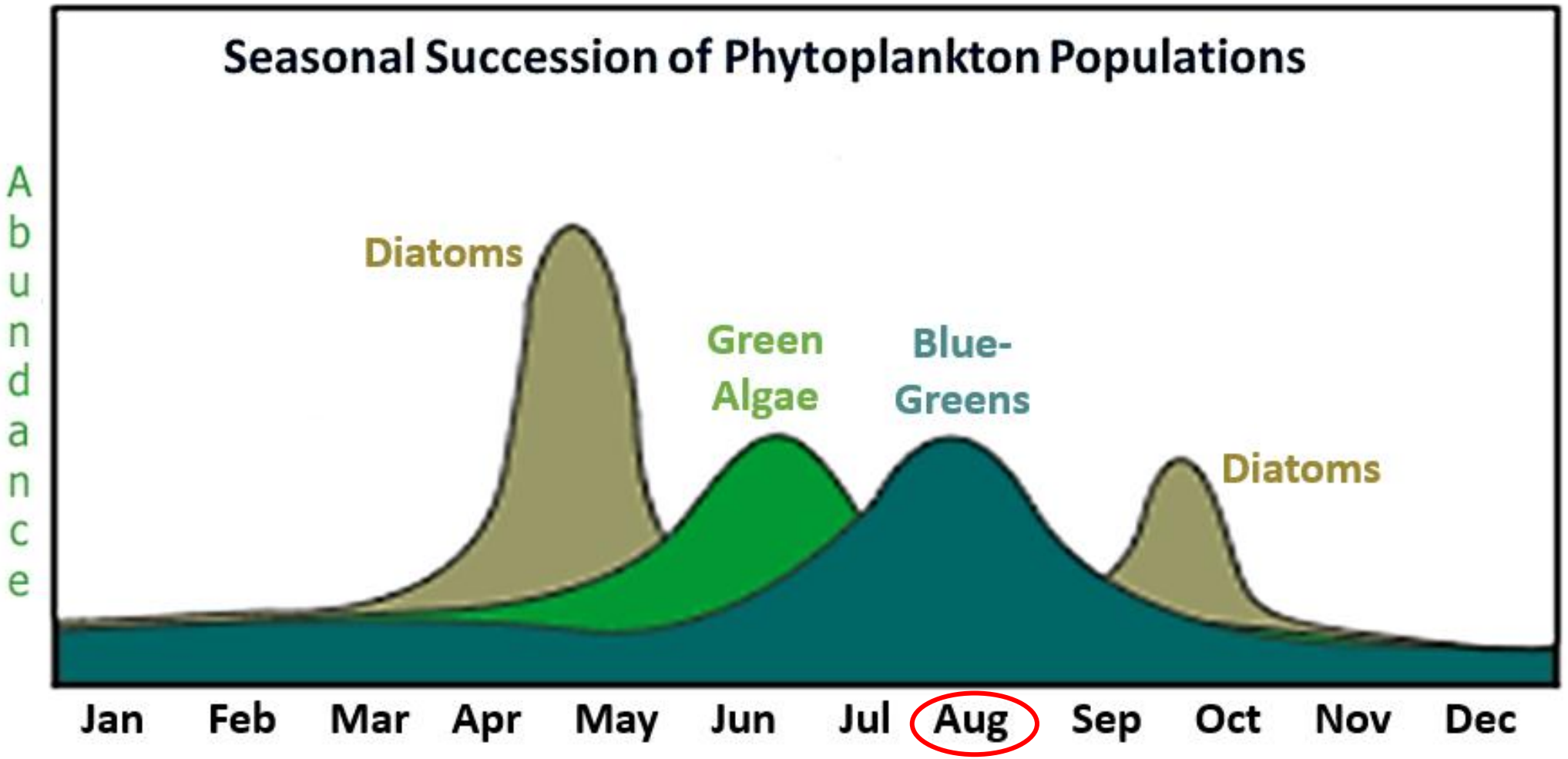
**Septic and Waterfowl Loading included in Tributary Estimate; Estimates from averaging period*

Lake/Watershed Nutrient Dynamics



Seasonal Progression of In-Lake Total Phosphorus

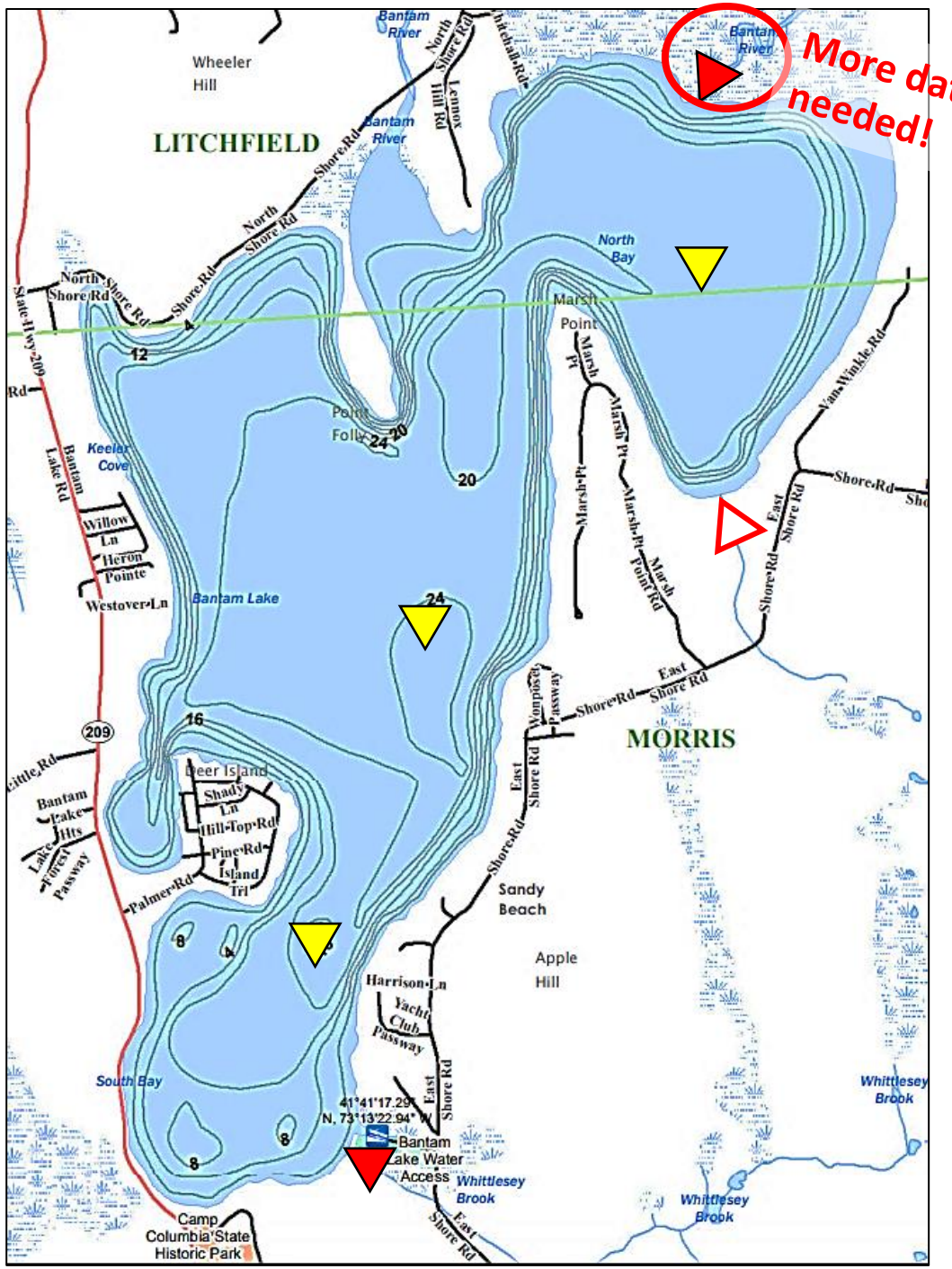



Seasonal Succession of Phytoplankton Populations
Abundance
Diatoms
Green Algae
Blue-Greens
Diatoms
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

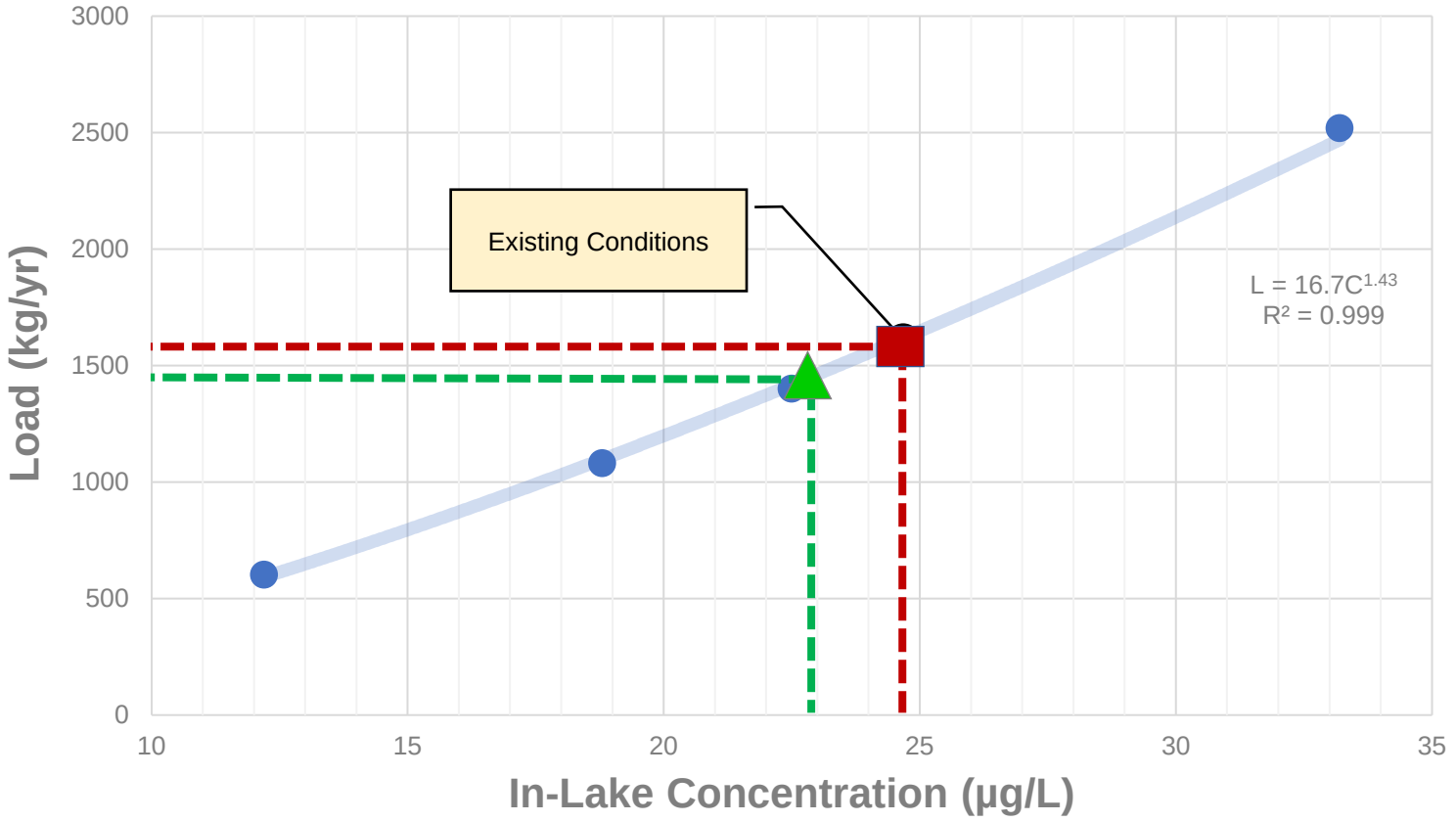
Sampling Locations

Prioritize:

- **deep hole(s)** ▼
- **primary tributaries**
  (just upstream of confluence**)** ▼



Nutrient Load Reduction Analysis



Current Conditions

Conc = 24.7 ug/L

Load = 1,606 kg/yr

Target Conditions

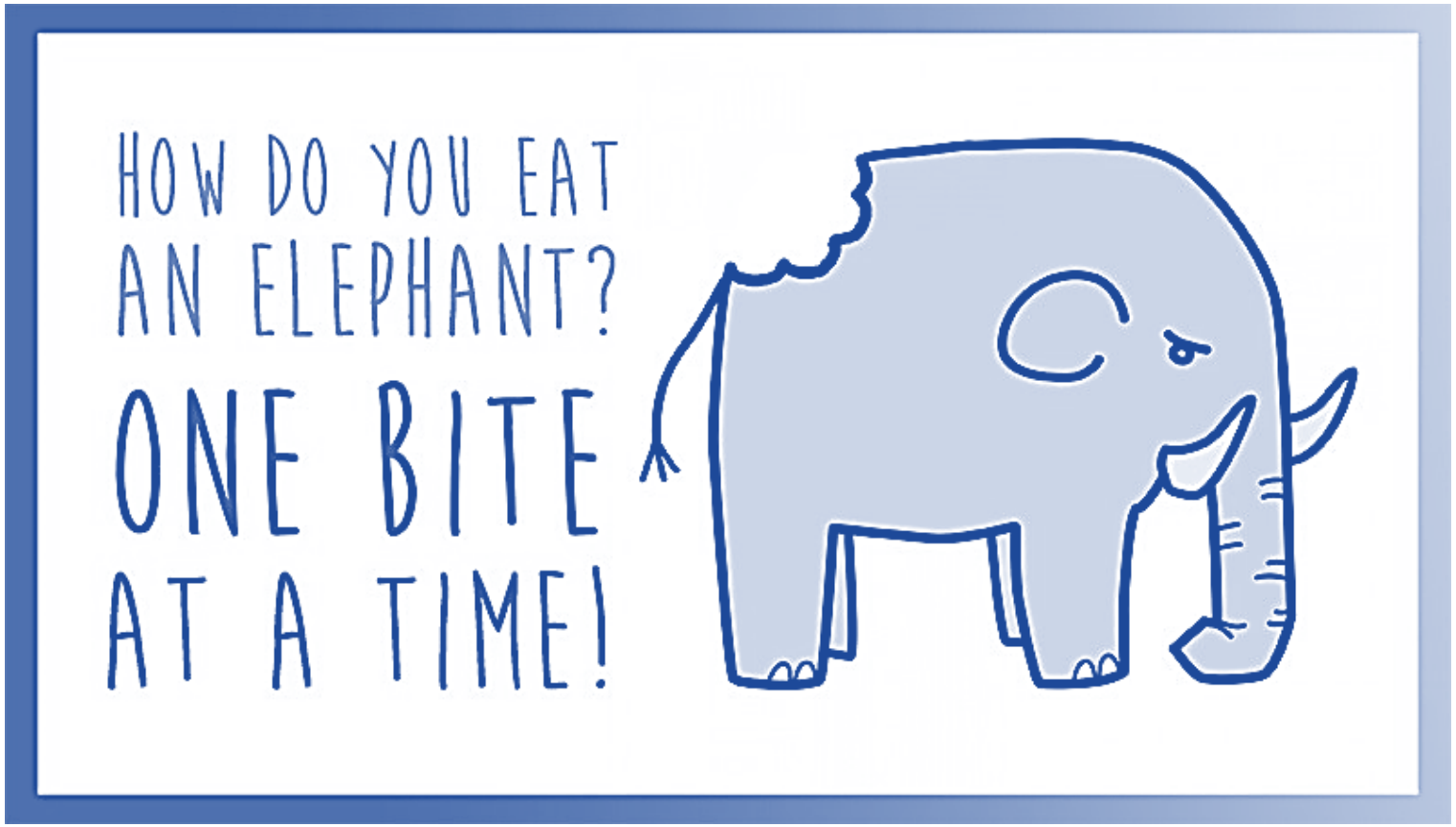
Conc = 23 ug/L

Load = 1,479 kg/yr

(- 127 kg/yr of P)

8.6% Reduction in P

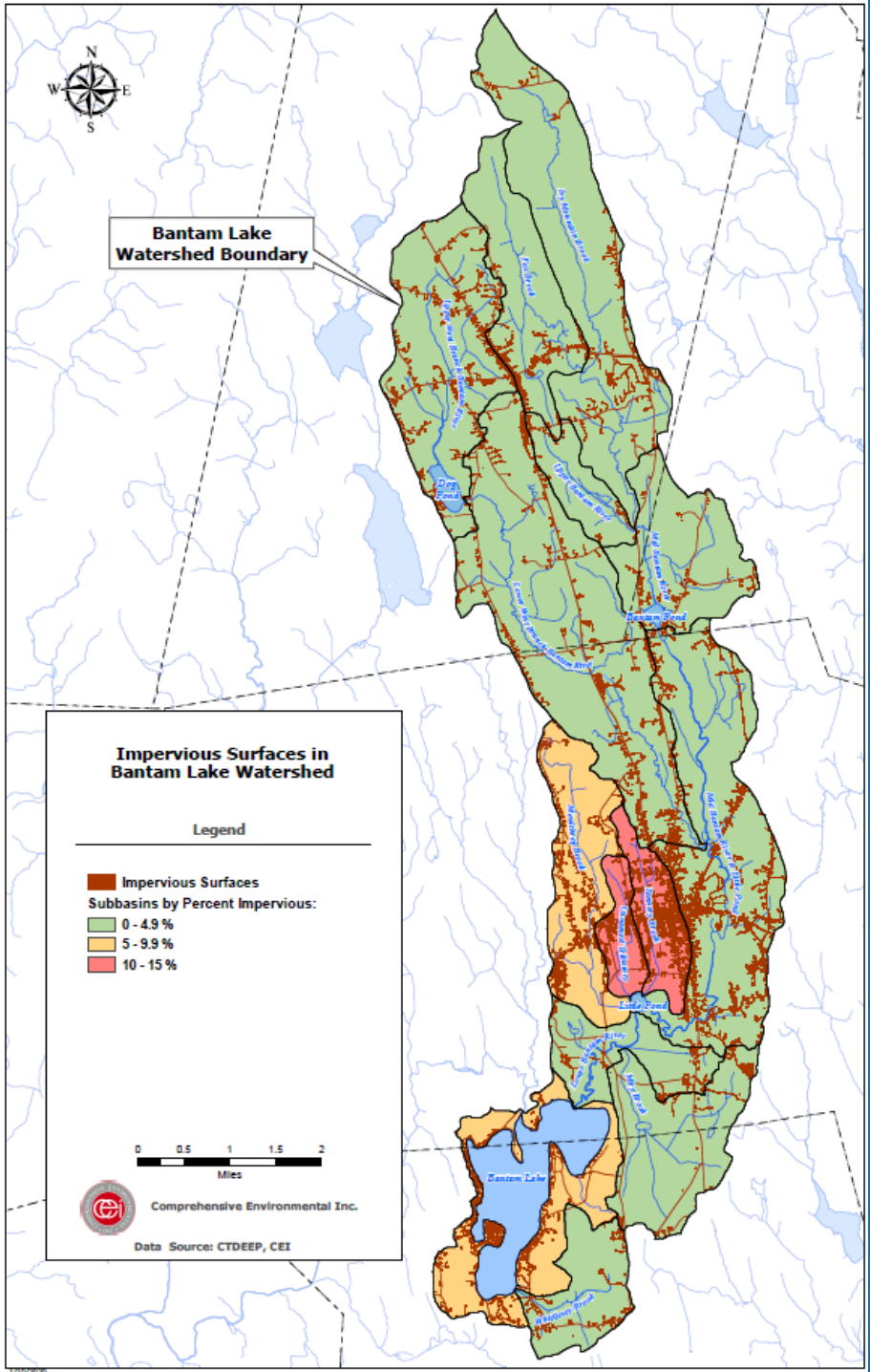
Goal = Reduce P by 127 kg/year



Overview of Bantam Lake Watershed Based Plan Project

- **Develop an "9-Element" Watershed Based Plan Addendum (WBPA) for Bantam Lake Watershed**

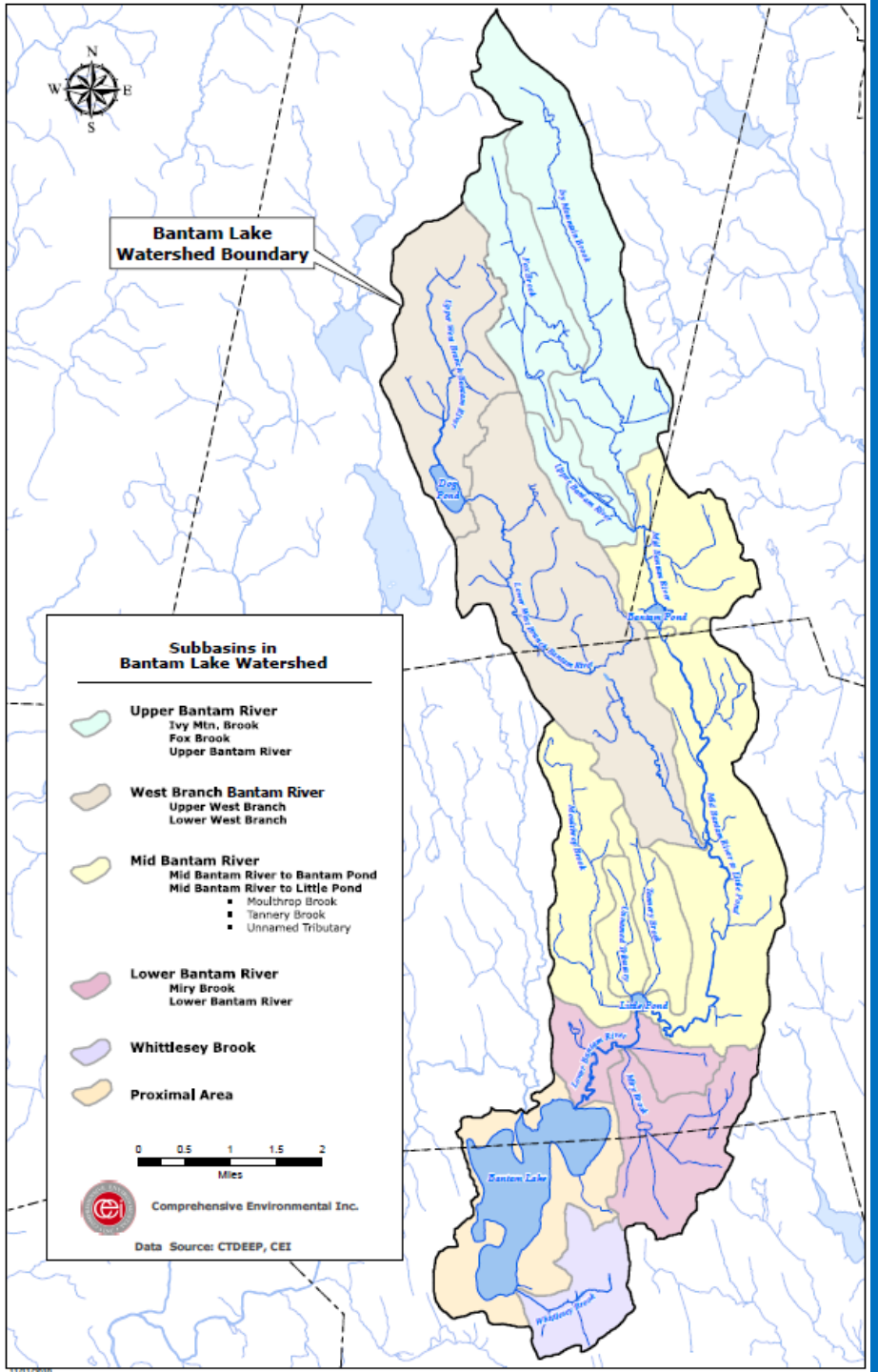
- **Produce a template that can be used to create future WBPAs for other CT lakes associated with the Statewide Lake Nutrient TMDL**



Watershed Based Plans

- ✓ Identify and quantify pollutant sources
- ✓ Determine potential solutions
- ✓ Develop plan to implement
- ✓ Develop plan to reassess

A 9-element plan is required for all s.319-funded watershed projects



The 9 Elements

Element A:

Identify ***causes and sources*** that need to be controlled to achieve necessary pollutant load reductions.

- ✓ **Desktop Analysis (GIS, Land Uses)**
- ✓ **Field Assessment**

The 9 Elements

Element B:
Determine ***pollutant load reductions*** needed
to meet water quality goals

✓ **Covered by Statewide Lake Nutrient TMDL**

The 9 Elements

Element C:

Develop ***management measures*** to achieve water quality goals.

Structural BMPs

Non-Structural BMPs

Public Education

✓ **Field Assessment**

The 9 Elements

Element D:
Estimate the ***technical and financial assistance*** needed to implement the plan.

- ✓ **Identify potential partners**
- ✓ **Identify potential funding sources**

The 9 Elements

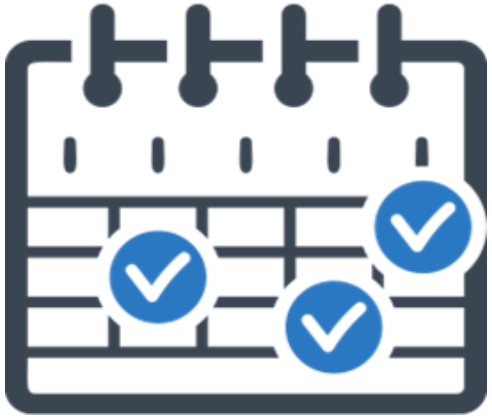
Element E:
Public Information and Education

- ✓ **Build upon outreach materials from Statewide Lake Nutrient TMDL**
- ✓ **Develop watershed-specific public information and education objectives**
- ✓ **Identify target audience for messages**

The 9 Elements

Element F: Implementation Schedule

Element G: Interim Measureable Milestones



- ✓ **Develop implementation schedule for recommended management measures**
- ✓ **Develop recommendations for measurable milestones**

The 9 Elements

Element H: Criteria to measure progress

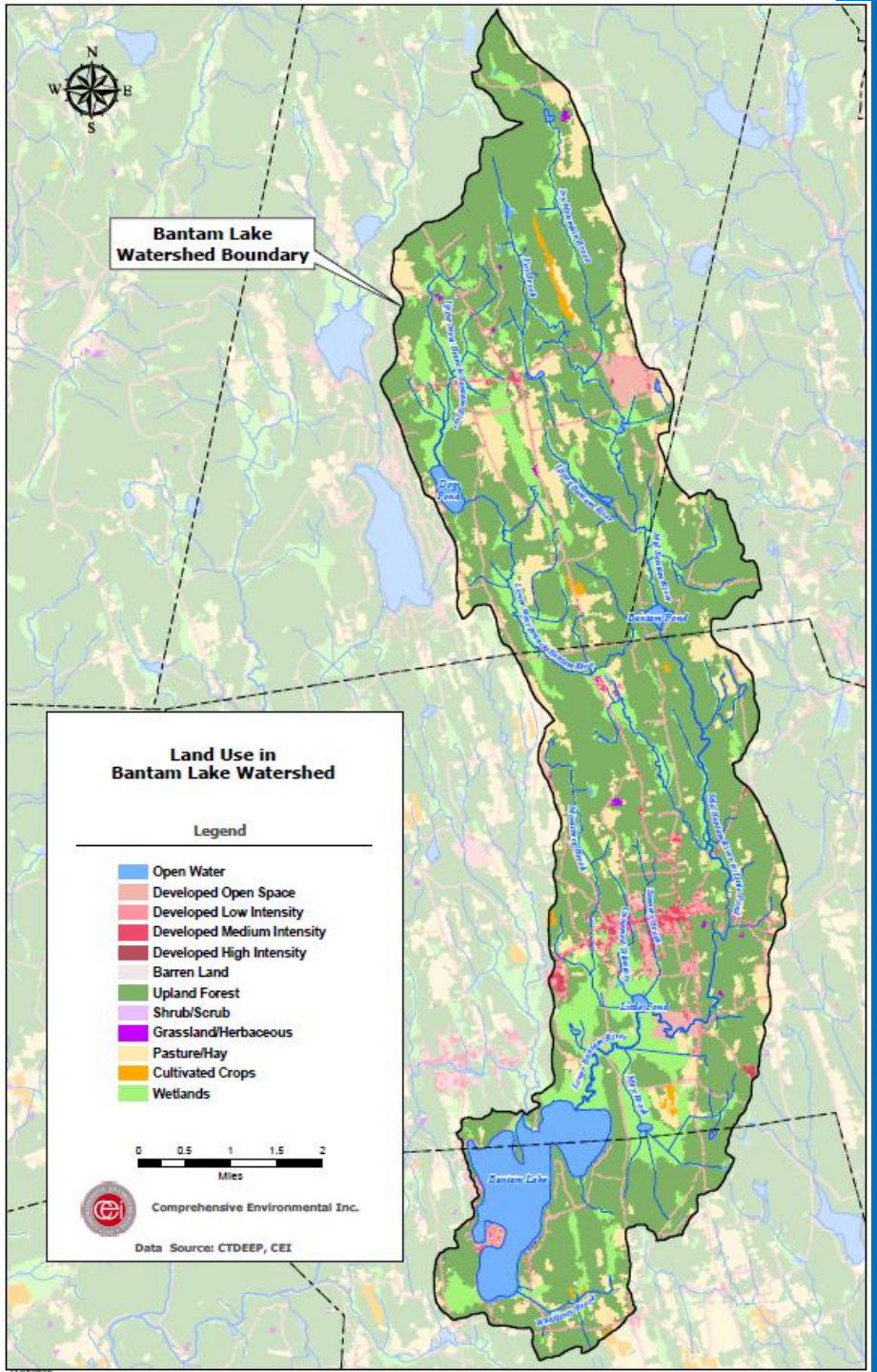
Element I: Monitoring

- ✓ **Develop recommendations for interim assessment of the performance of the management measures**
- ✓ **Monitoring – covered by Statewide Lake Nutrient TMDL**

Project Task:

Bantam Lake Watershed Assessment

- **Guided by public input and desktop analysis**
- **Field assessment of watershed, pollution sources, and BMP sites**



Project Task: Develop NPS Management Measures for Bantam Lake Watershed

- **Guided by watershed assessment**

  - ✓ **Develop list of recommended management measures**
  - ✓ **Identify potential watershed-wide implementation locations and pollutant load reductions**
  - ✓ **Optimization analysis**
  - ✓ **Conceptual design plan and fact sheets**

Project Task: Develop NPS Management Measures for Bantam Lake Watershed

Structural BMPs

Project Task: Develop NPS Management Measures for Bantam Lake Watershed

Non-Structural BMPs

Public Education

Brainstorming for Watershed Assessment

Problem Type	Description
EROSION - Surface Erosion - Road Shoulder Erosion - Ditch - Shoreline / Stream Bank - Bare/uncovered soil/sand/salt stockpile	**Severity:** Slight, Moderate, Severe **Size:** Length/Width, Area

Brainstorming for Watershed Assessment

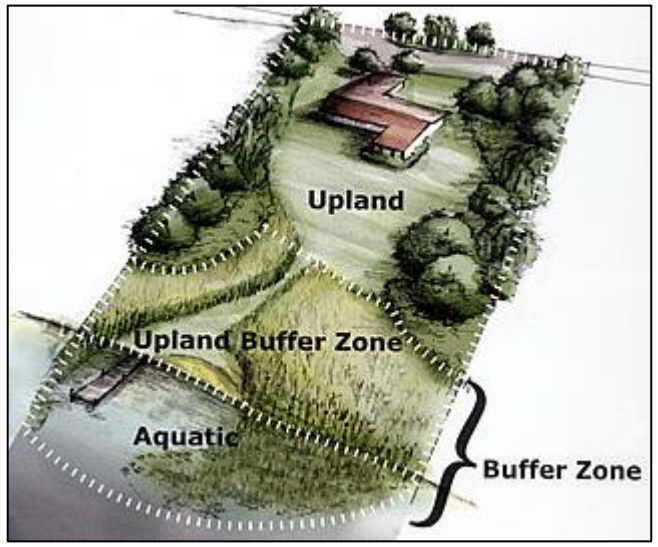
Problem Type	Description	
Culverts/Infrastructure	Unstable Inlet/Outlet Clogged/Buried	Crushed/Broken Undersized

Brainstorming for Watershed Assessment

Problem Type	Description
Parking Lots	Drains Directly to Waterbody Evidence of Concentrated Flow

Brainstorming for Watershed Assessment

Problem Type	Description	
Shoreline	Undercut Lack of Shoreline Vegetation	Erosion Unstable Access



Brainstorming for Watershed Assessment

Problem Type	Description
Agriculture	Livestock Access to Waterbody Manure Washing Off-Site Tilled Eroding Fields Inadequate Buffer
Other (e.g., area to improve stormwater treatment)	Improve treatment; reduce flooding; increase infiltration; re-vegetate

Brainstorming for Watershed Assessment

Problem Type	Description
EROSION - Surface Erosion - Road Shoulder Erosion - Ditch - Shoreline / Stream Bank - Bare, uncovered stockpile	**Severity:** Slight, Moderate, Severe **Size:** Length/Width, Area
Culverts/Infrastructure	Unstable Inlet/Outlet Crushed/Broken Clogged/Buried Undersized
Parking Lots	Drains Directly to Waterbody Evidence of Concentrated Flow
Shoreline	Undercut Erosion Lack of Shoreline Vegetation Unstable Access
Agriculture	Livestock Access to Waterbody Tilled Eroding Fields Manure Washing Off-Site Inadequate Buffer
Other (e.g., area to improve stormwater treatment)	Improve treatment; reduce flooding; increase infiltration; re-vegetate

Brainstorming for Watershed Assessment

Contact for watershed assessment information:

Emily DiFranco

edifranco@ceiengineers.com

603-343-6311

Thank you for your time!