



Lake Pocotopaug Conference

East Hampton Middle School

January 17, 2008, 7-9 p.m.

Lake Pocotopaug Conference

Why Are We Here?







Filamentous Nitrogen-Fixing Cyanophyte
(a.k.a. Cyanobacteria or Blue-Green Algae):
Anabaena aphanizomenoides

Lake Pocotopaug Conference

Lake Pocotopaug Commission Ordinance

Section 2 – Purpose and Goals

“...It shall seek input and establish relationships when necessary with ... town organizations and commissions to create necessary Lake Protection programs or actions to abate algae and aquatic weed growth, improve fish populations, and combat existing and potential sources of pollution...”

Lake Pocotopaug Conference

Conference Mission Statement

To create opportunities for partnership among town commissions for improving Lake Pocotopaug by raising awareness, providing information, and promoting solutions.



Conference Agenda

- Opening Remarks Bob Hart, LPC
- Causes of Lake Pocotopaug Impairment Wendy Gendron, ENSR
- Current Status of Lake Pocotopaug Tom Wells, LPC
- Survey Results – What Has the Commission Learned From the Survey? John Ciriello, LPC
- How Have Other Towns & Lake Associations Addressed These Problems?
 - Hebron John Ciriello, LPC
 - Lake Waramaug Jack Solomon, LPC
 - Lake George Jack Solomon, LPC

Conference Agenda

- **How Do Current Regulations and Practices Affect the Lake?**
 - Inland Wetlands & Watercourses Agency Jeffry Foran, IWWA
 - Planning & Zoning Commission Peter Aarrestad, P&Z
- **What Are the Next Steps For Our Town?**
 - Lake Pocotopaug Commission Bob Hart, LPC
 - General Discussion
- **Closing Remarks** Bob Hart, LPC

Causes of Lake Pocotopaug Impairment

Causes of Lake Impairment

Wendy Gendron, ENSR International



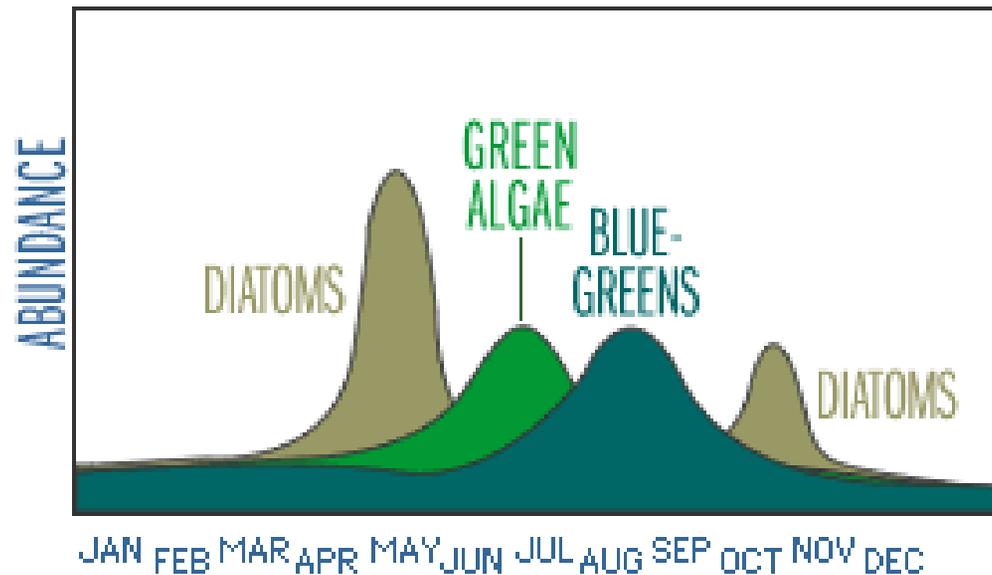
Causes of Lake Pocotopaug Impairment

Limnology Primer

- **Lake Pocotopaug listed on the 303(d) list**
 - Designated use impairment – contact recreation
 - Cause - excessive algal growth
 - Excessive algal growth
 - Reduces water clarity
 - Can impart taste and odor
 - Loss of rooted aquatic plants
 - Reduced dissolved oxygen
 - Decline in fishery
 - Aesthetically unpleasing
 - Harmful algal blooms – cyanobacteria

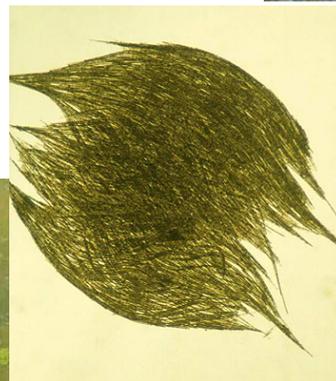
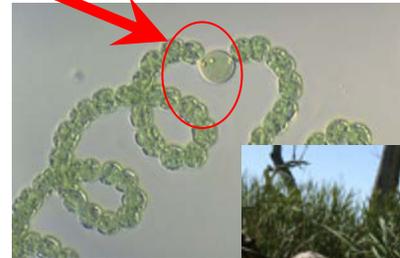
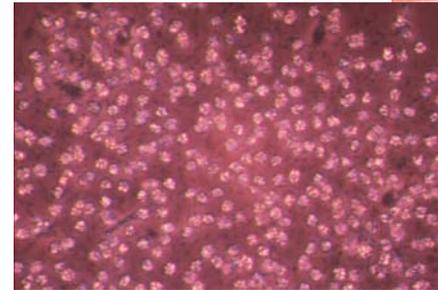
Algal Growth Pattern

SEASONAL SUCCESSION OF PHYTOPLANKTON POPULATIONS



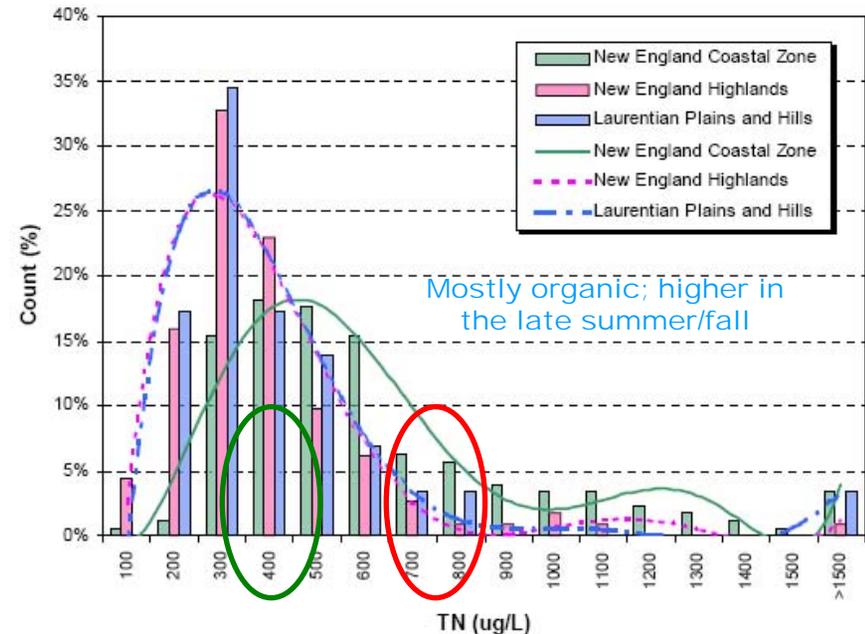
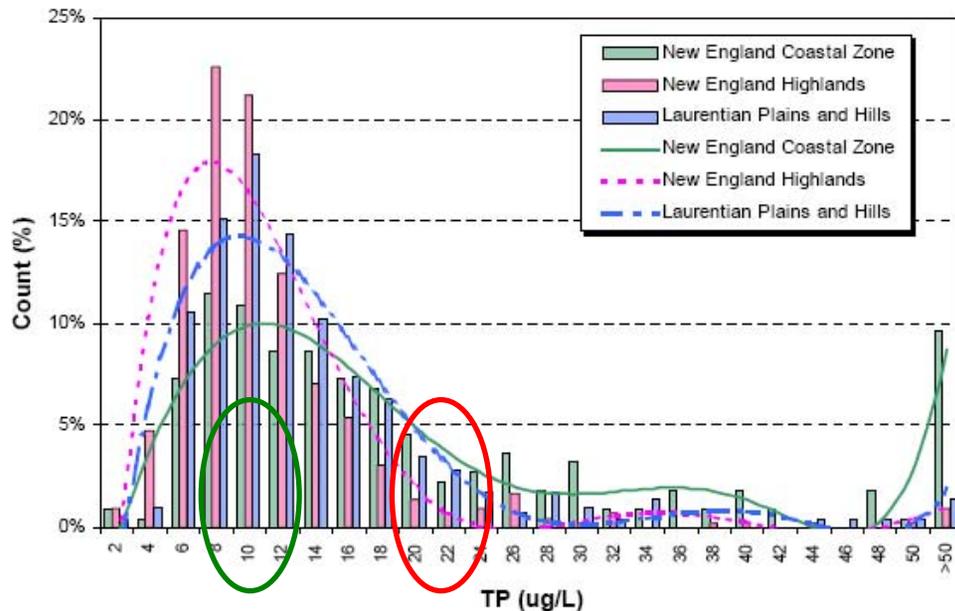
Cyanobacteria

- Favored under excessive nutrient conditions and when TN:TP ratios are low
- Produce toxins (neurotoxins, hepatotoxins and dermatitis)
 - *Microcystis aeruginosa*
 - *Anabaena circinalis*
 - *Anabaena flos-aquae*
 - *Aphanizomenon flos-aquae*
 - *Cylindrospermopsis raciborskii*
- **LP - Anabaena**



Algal Growth Pattern

- Nutrient in shortest supply limits growth
- Phosphorus Limiting in LP (average TN:TP = 39)

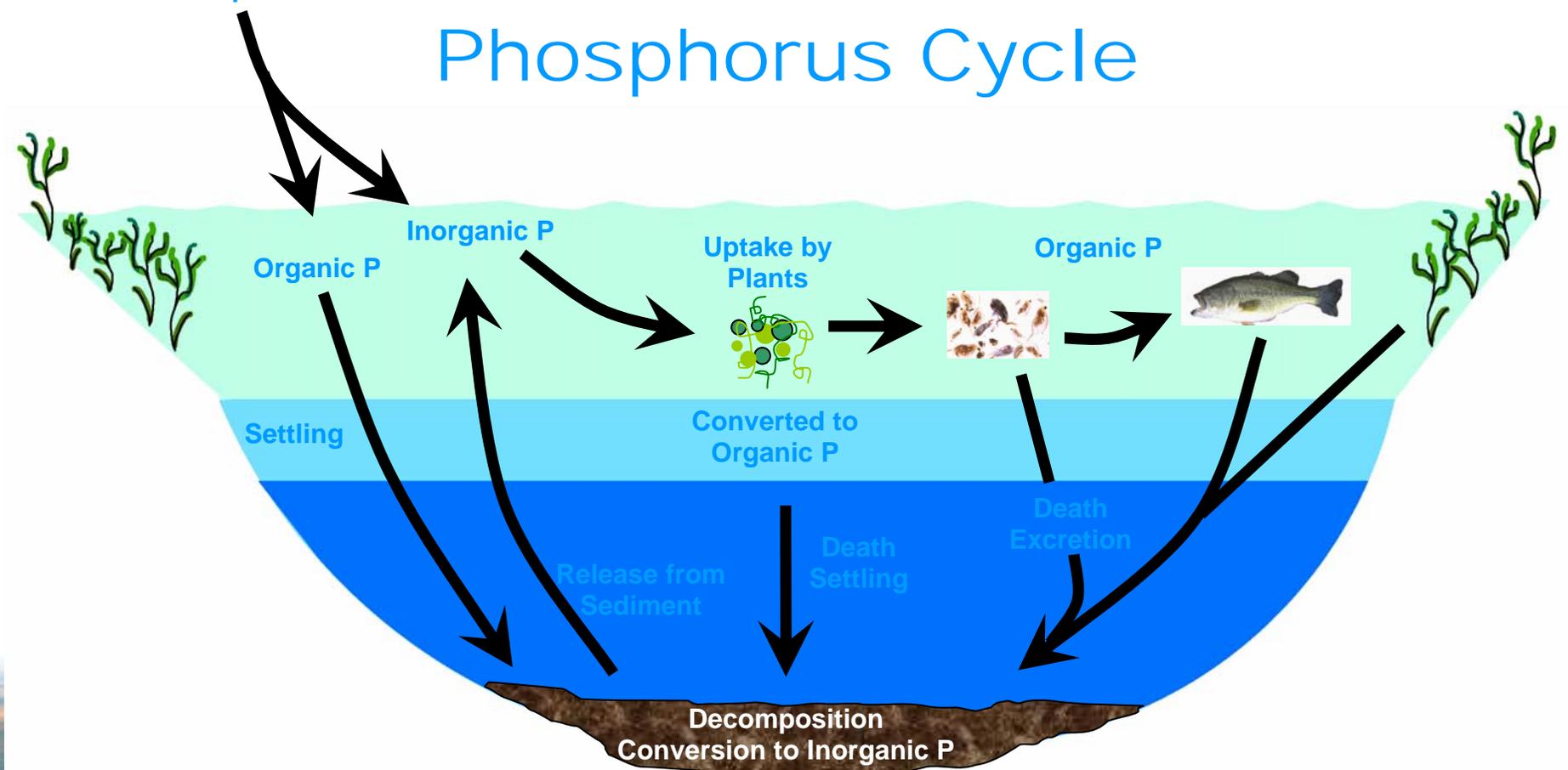


What causes algal blooms

- Eutrophic conditions – excessive nutrients P & N

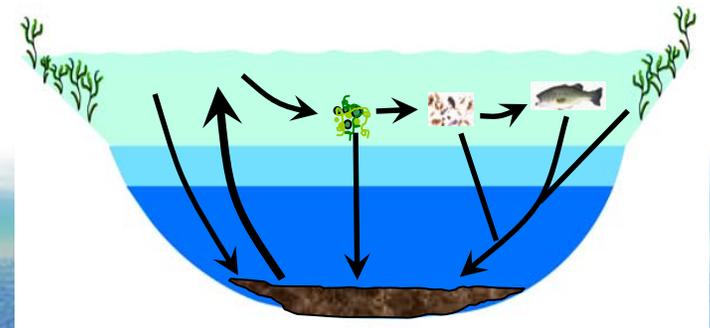
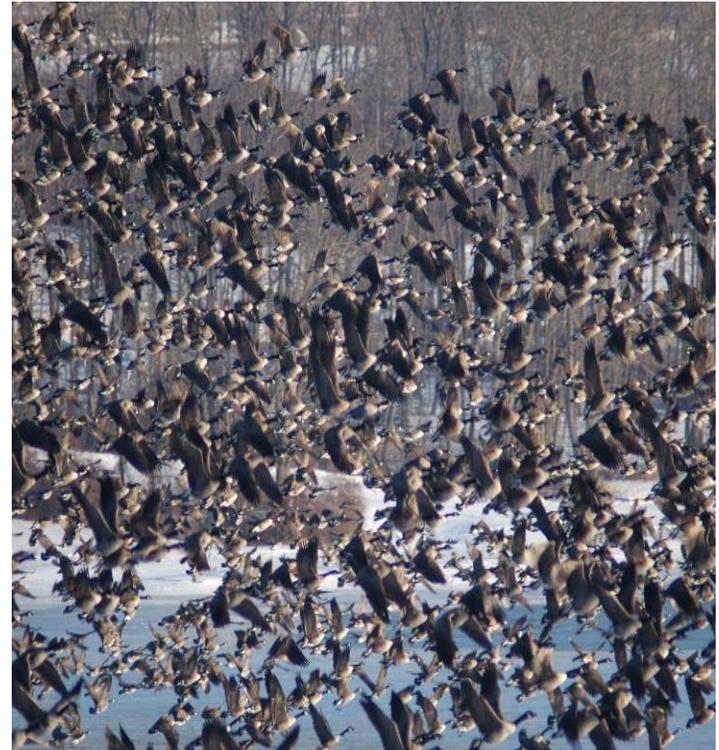
Watershed Inputs

Phosphorus Cycle



Where does P come from?

- Internal Sources
 - Waterfowl
 - Internal recycling
 - Low/no oxygen



Where does P come from?

- External Sources

- Decomposition of organic matter - P is essential for plants, animals and humans
- Rock/soils - 11th most abundant mineral in earth crust
- Pet/wildlife waste
- Failing or improperly maintained septic systems



Where does P come from?



- External Sources

- Agricultural runoff (row crops)
- Fertilizers (agric, lawns, nursery)
- Stream bank/bed erosion



Where does P come from?

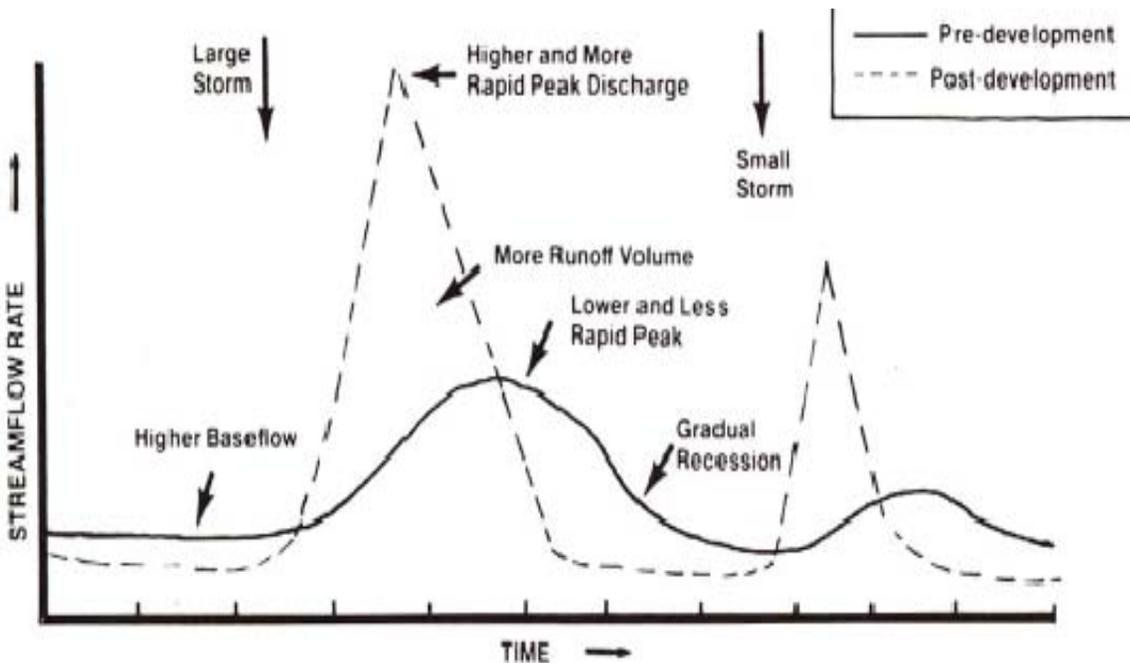
- External sources

- Waste water treatment plant effluent
- Industrial discharges
- Illicit stormwater sewer connections
- Development - Stormwater (MS4s, construction, creation of impervious surfaces)



Development Impacts

- Development – Impervious Surfaces
- Impacts to hydrology

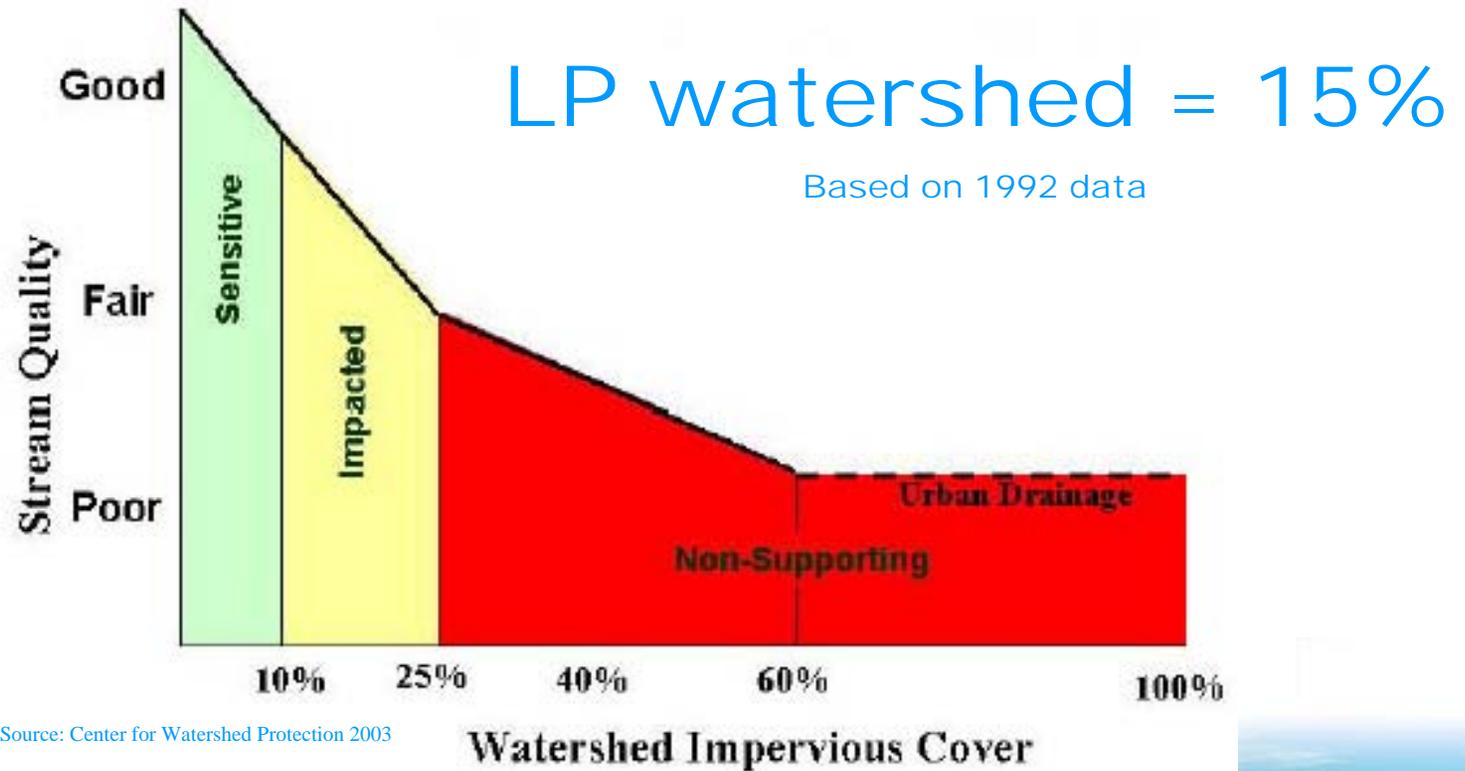


Source: Center for Watershed Protection 2003



Development Impacts

- Development – Impervious Surfaces
- Impacts to Water Quality



Where does P come from?

	2002 Report		More Recent Data	
	lbs/yr	% of Total	lbs/yr	% of Total
Direct Precipitation (Atmosphere)*	77	7-13	164	19-21
Gound Water	26	2-4	0-26	0-3
Surface Water (Watershed)	310-816	50-73	577	68-74
Waterfowl	66	6-11	43	5
Internal Recycling**	137	12-22	0-35	0-4
Total	617-1122		784-845	

* difference due to using different annual precipitation values using literature value
** reduction assumed from alum treatment

Will be preparing a detailed budget with DEP
As part of the TMDL process

Take Home Message

- The watershed contribution is the largest controllable source of phosphorus in the Lake Pocotopaug
- A 65% reduction is the maximum likely reduction that can be achieved – aggressive target
- This will need to be accomplished through:
 - Source reductions and activity controls – control or eliminate sources (behavior modification, fertilizer restrictions, etc)
 - Transport mitigation – capture and remove pollutants (detention ponds, drainage swale, infiltration trenches, etc)
 - Ecosystem management – minimize impacts and repair damage when fails (LID, ordinances/bylaws, performance bonds, etc)



Current Status of Lake Pocotopaug

Current Status

Tom Wells, LPC



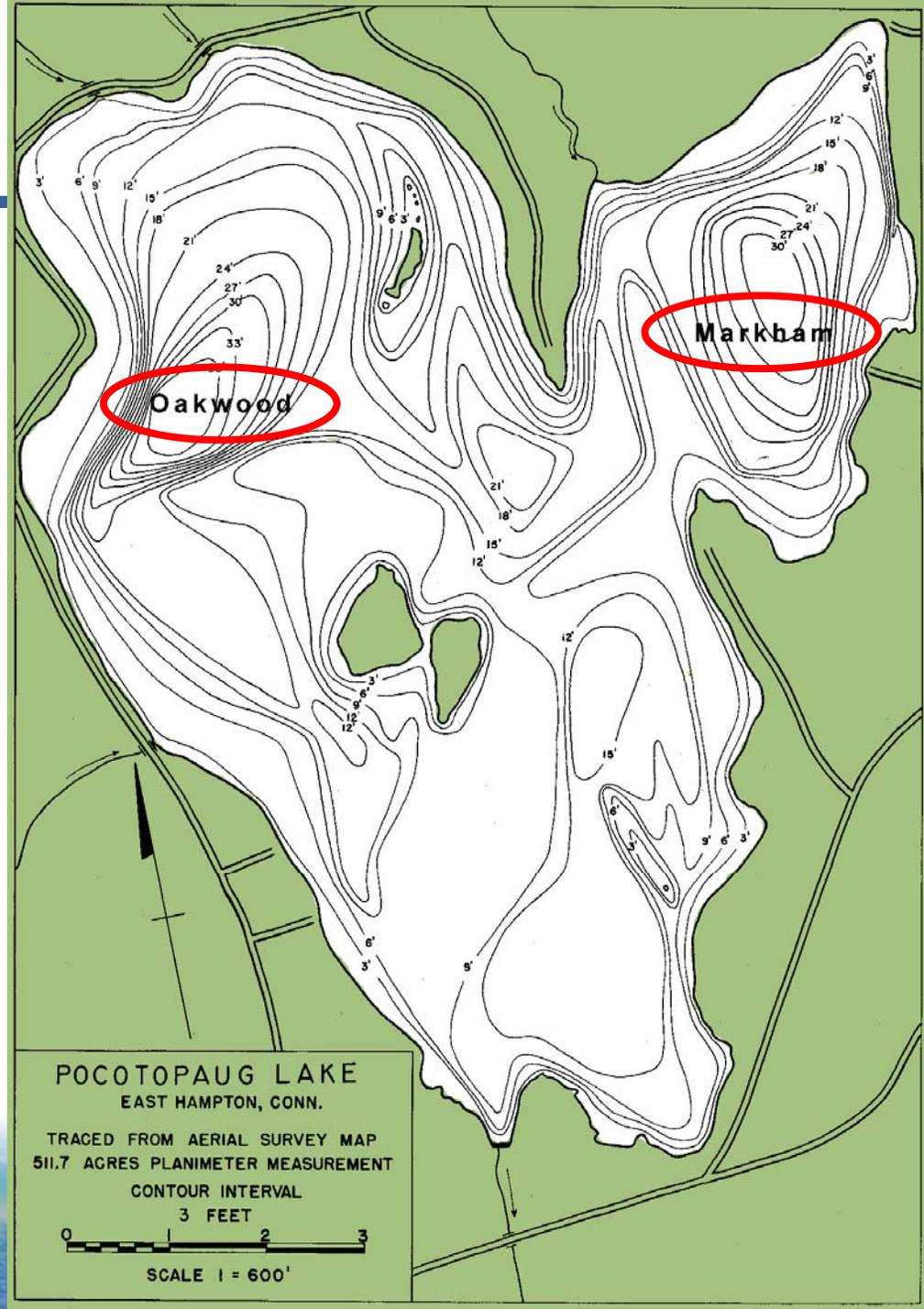
In-Lake Studies

- 2007: Lake Pocotopaug Commission
- 2000-2006: ENSR
- 1991-1995: Volunteer Lake Study Group with East Hampton Health Dept.
- 1995-2005: Volunteer Lake Study Group
- 1993: Frugro & McClelland
- Some historical data from 1937, 1938, 1954, and 1974

What Was Measured in 2007

- Transparency
- Dissolved oxygen
- Temperature
- Total Phosphorus
- Dissolved Phosphorus
- TKN
- Ammonia
- Nitrite/Nitrate
- Rainfall
- Water Level

In-Lake Sampling Locations



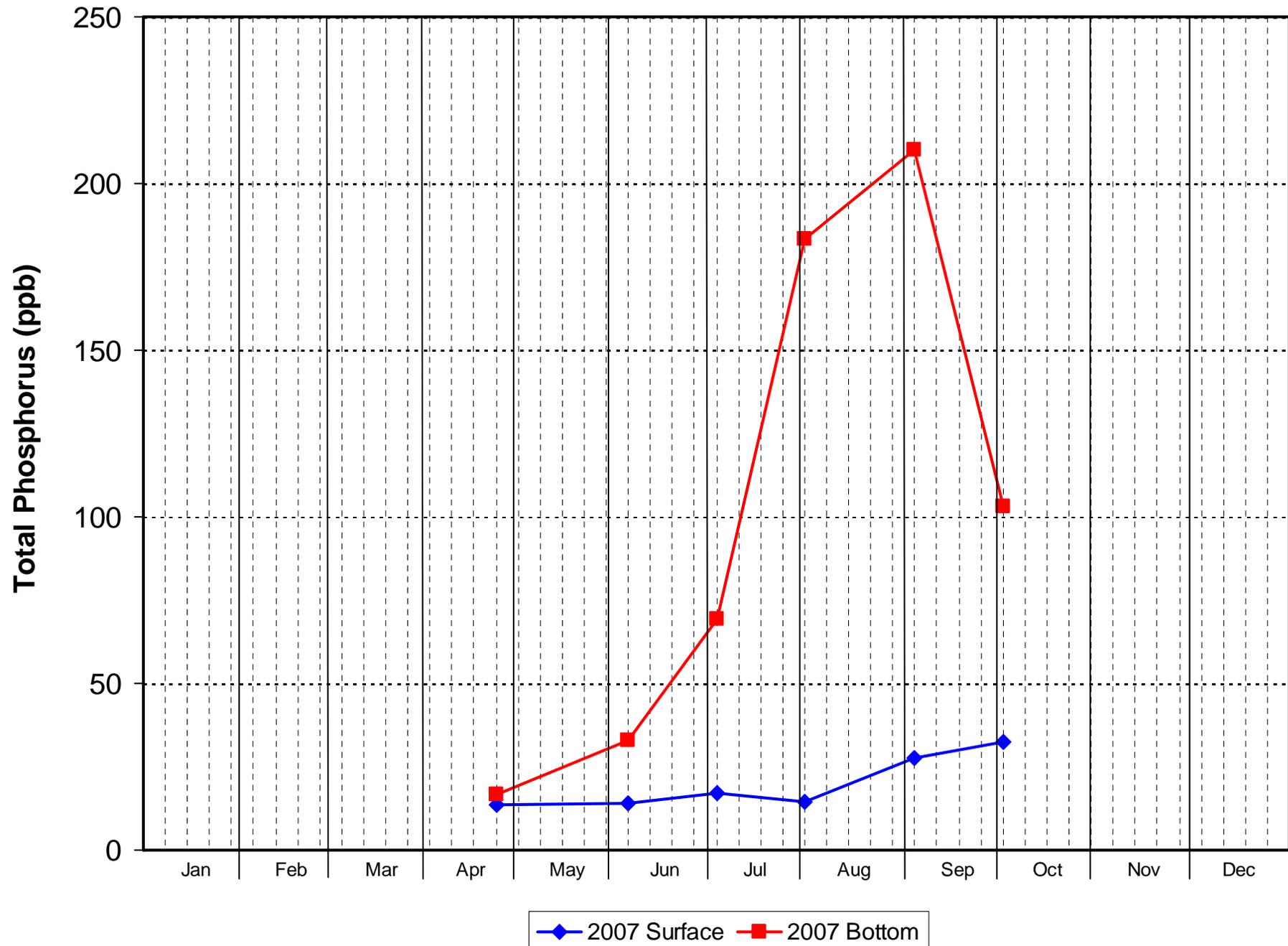
Current Status of Lake Pocotopaug

- Transparency
 - A measure of water clarity that approximates what we see
 - Measured with a Secchi Disk
- Phosphorus
 - The Limiting Nutrient
 - Samples collected and sent to a Lab for analysis

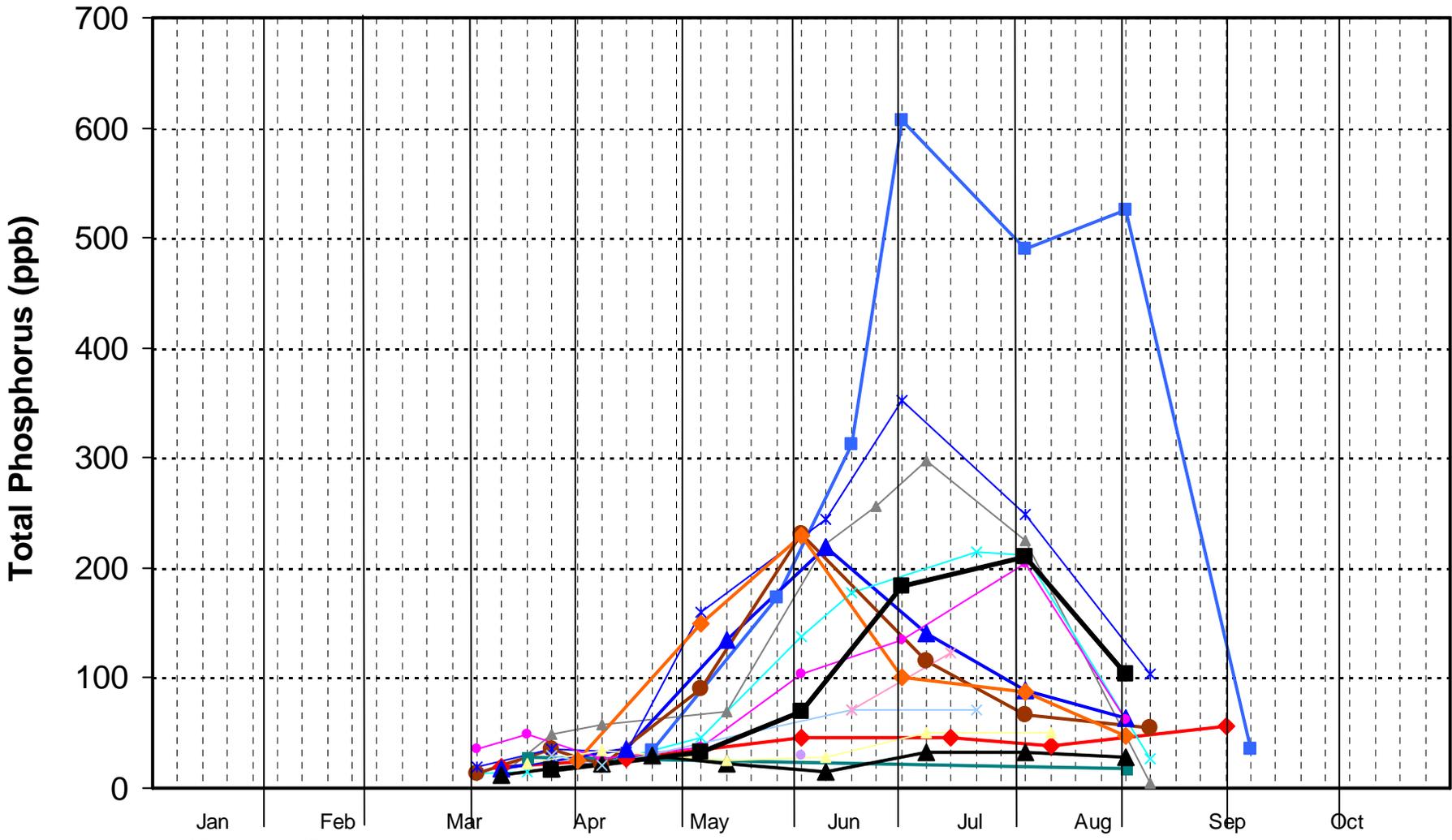
Phosphorus (P)

- The Limiting Nutrient
 - Only trace amounts needed for growth
 - Usually the “throttle” for algal growth in lakes
 - More phosphorus generally means more algae
- Internal Loading Recycles P Stored In Bottom
 - Most P sinks to the bottom
 - Deep area sediments release P during summer when the lake is thermally stratified and bottom oxygen levels drop to near zero
- Samples taken at the surface and bottom and sent to a laboratory for analysis

2007 Total Phosphorus

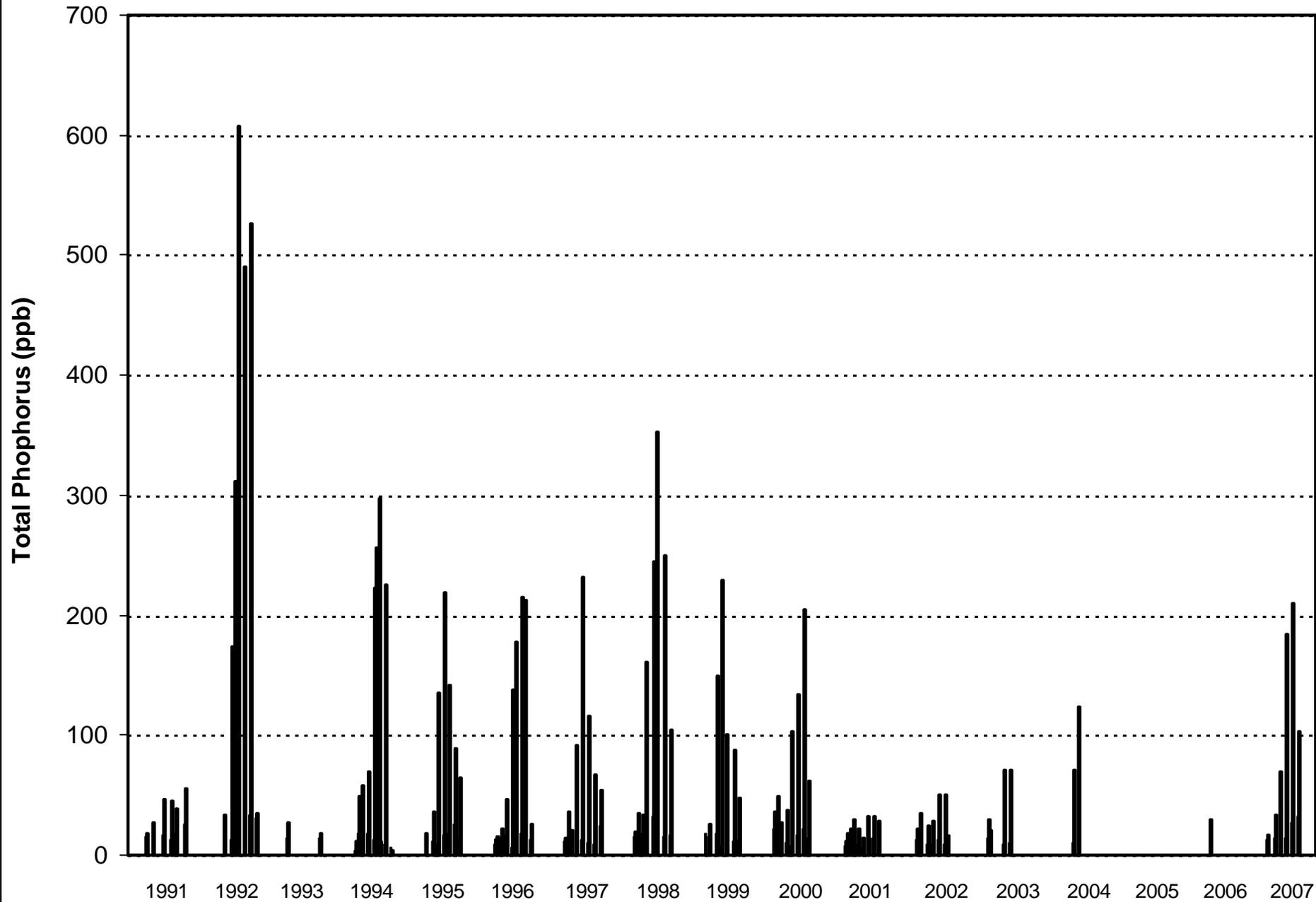


Bottom Total Phosphorus 1991 - 2007

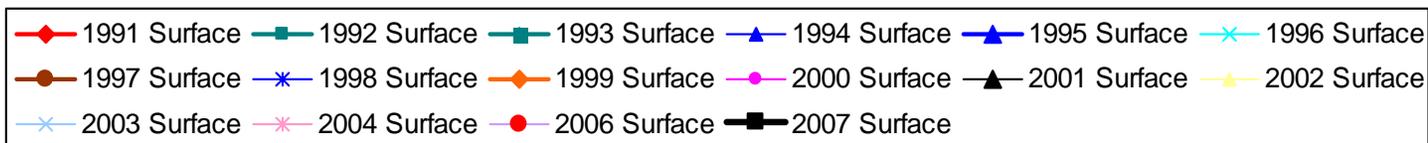
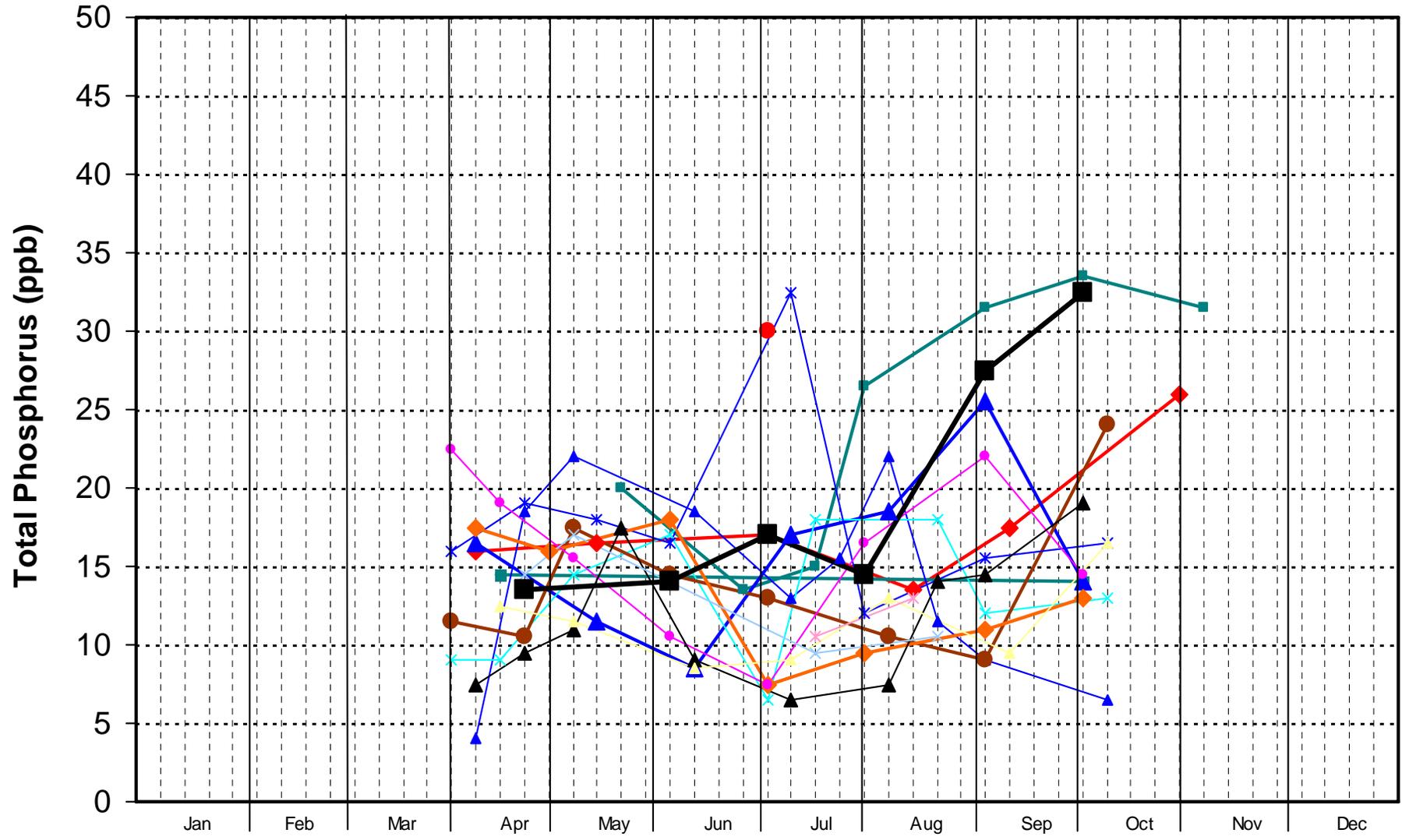


- ◆ 1991 Bottom ■ 1992 Bottom ■ 1993 Bottom ▲ 1994 Bottom ▲ 1995 Bottom ✕ 1996 Bottom
- 1997 Bottom ✕ 1998 Bottom ◆ 1999 Bottom ◆ 2000 Bottom ▲ 2001 Bottom ▲ 2002 Bottom
- ✕ 2003 Bottom ✕ 2004 Bottom ● 2006 Bottom ■ 2007 Bottom

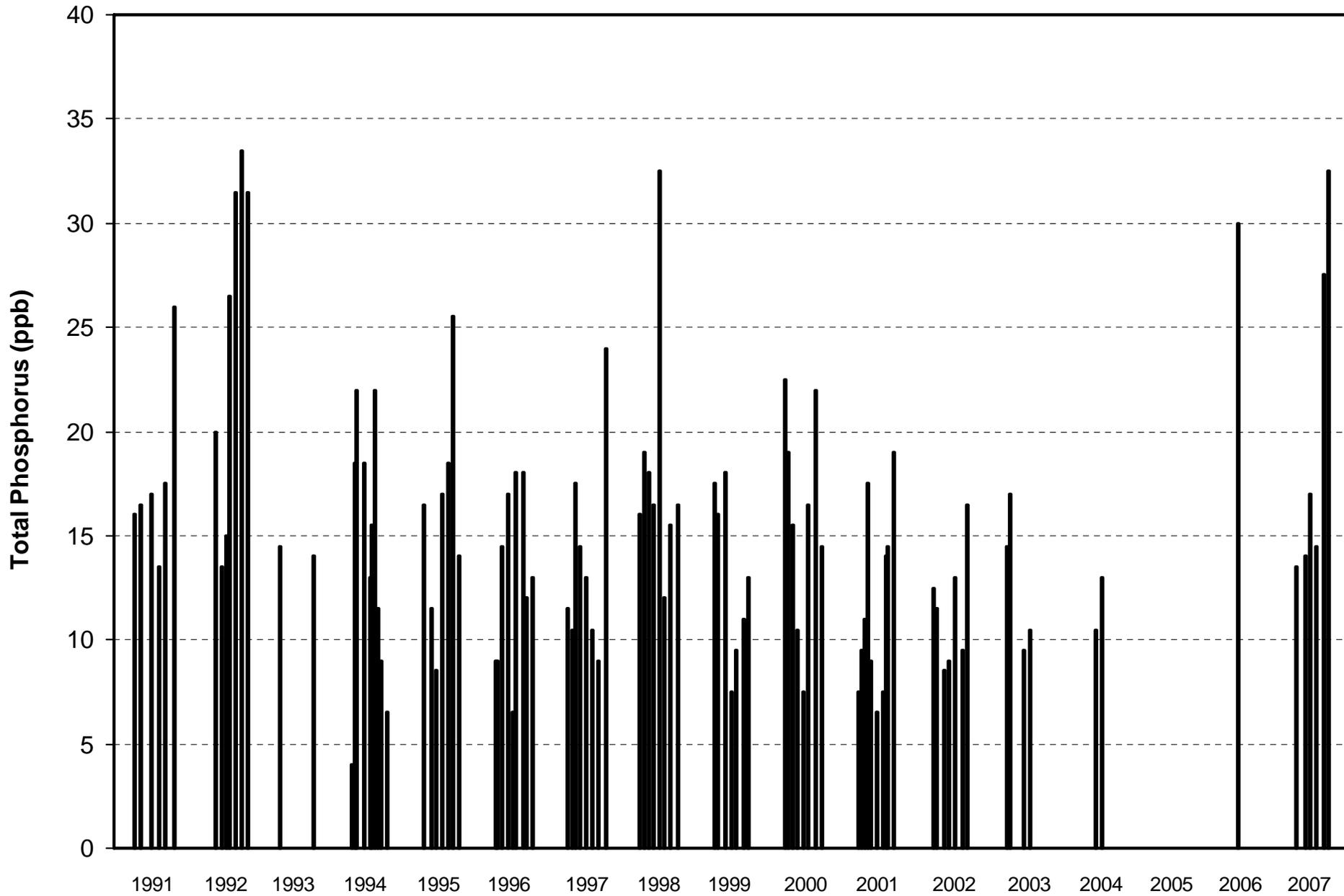
Bottom Total Phosphorus 1991 - 2007



Surface Total Phosphorus 1991 - 2007



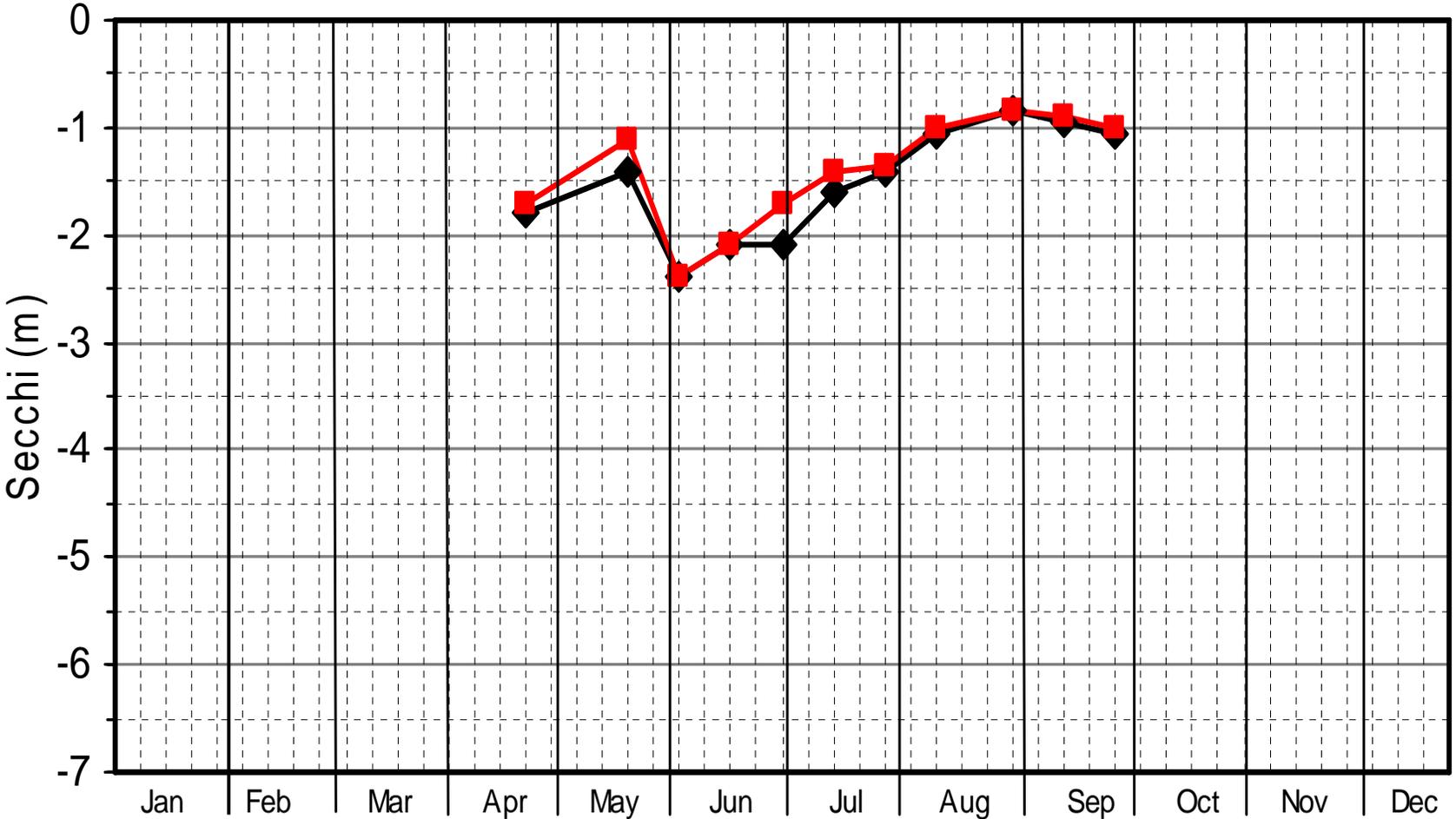
Surface Total Phosphorus 1991 - 2007



Transparency: What We See



2007 TRANSPARENCY BY STATION

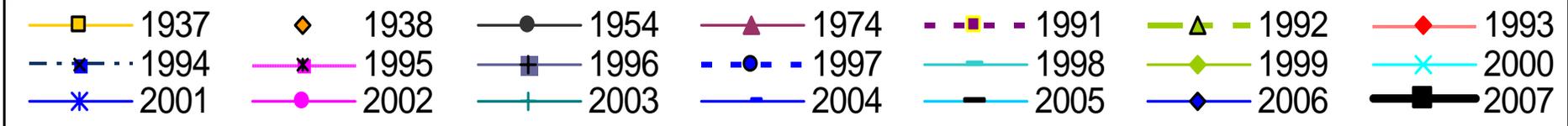
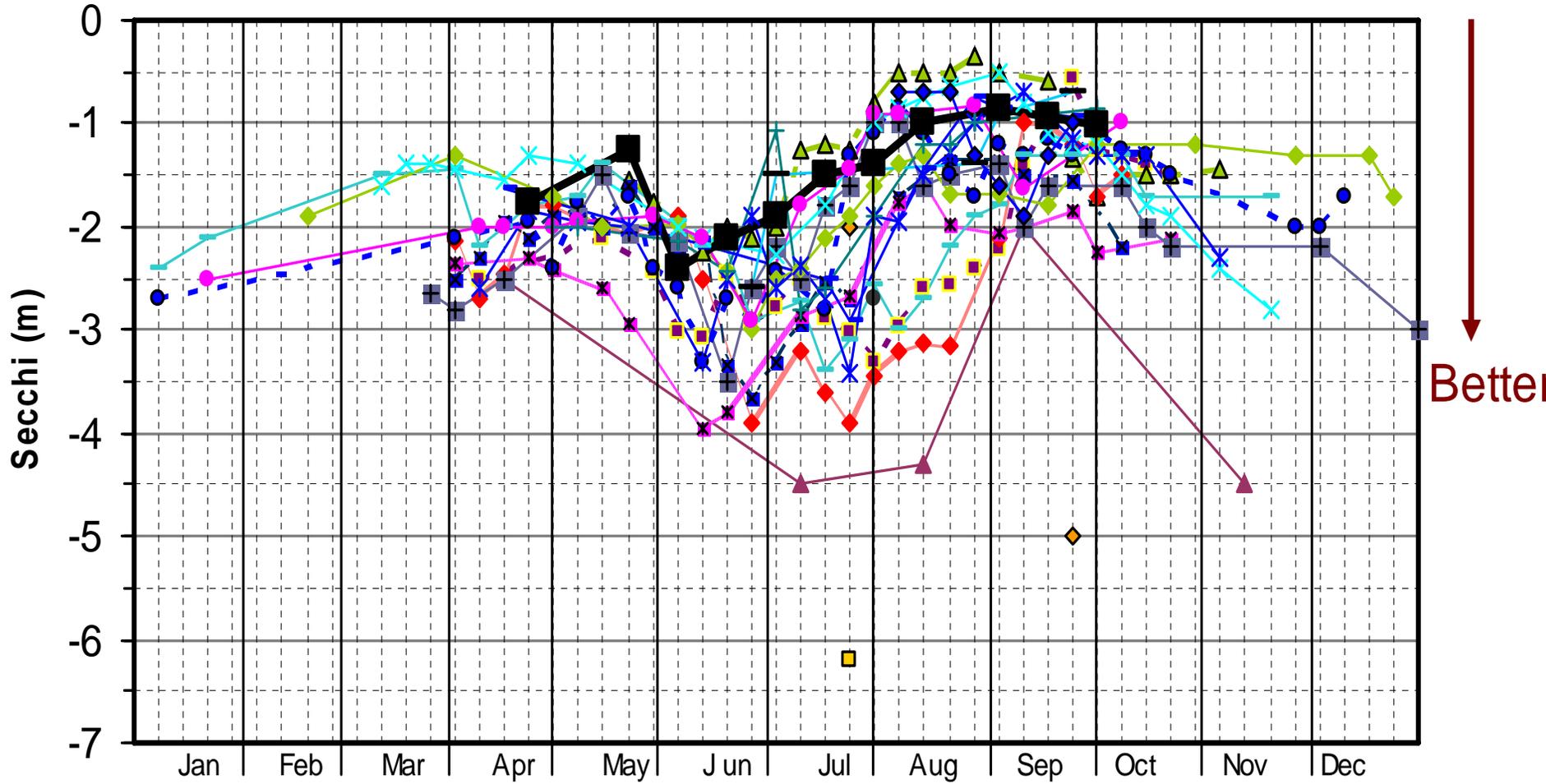


↓
Better

◆ 2007 Oakwood

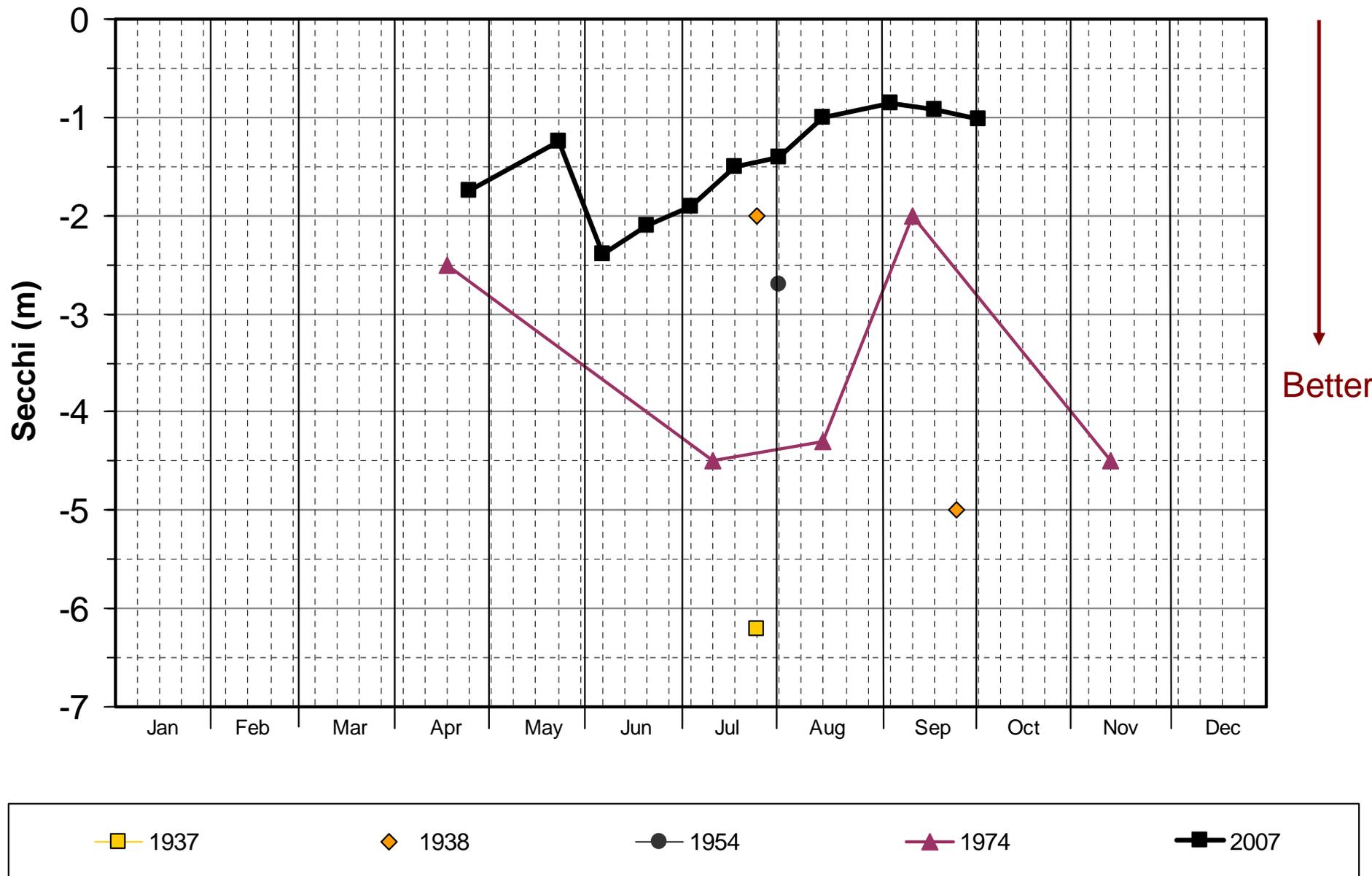
■ 2007 Markham

Transparency 1937 - 2007

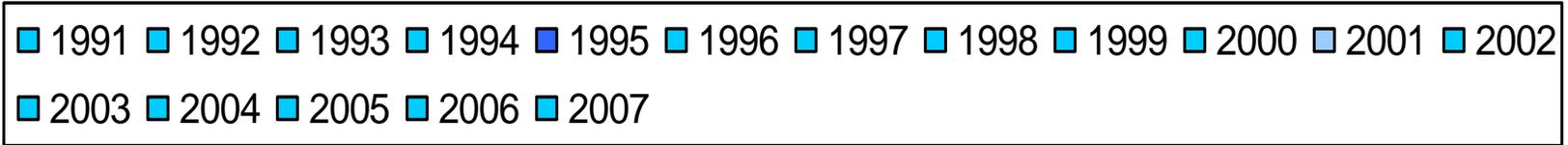
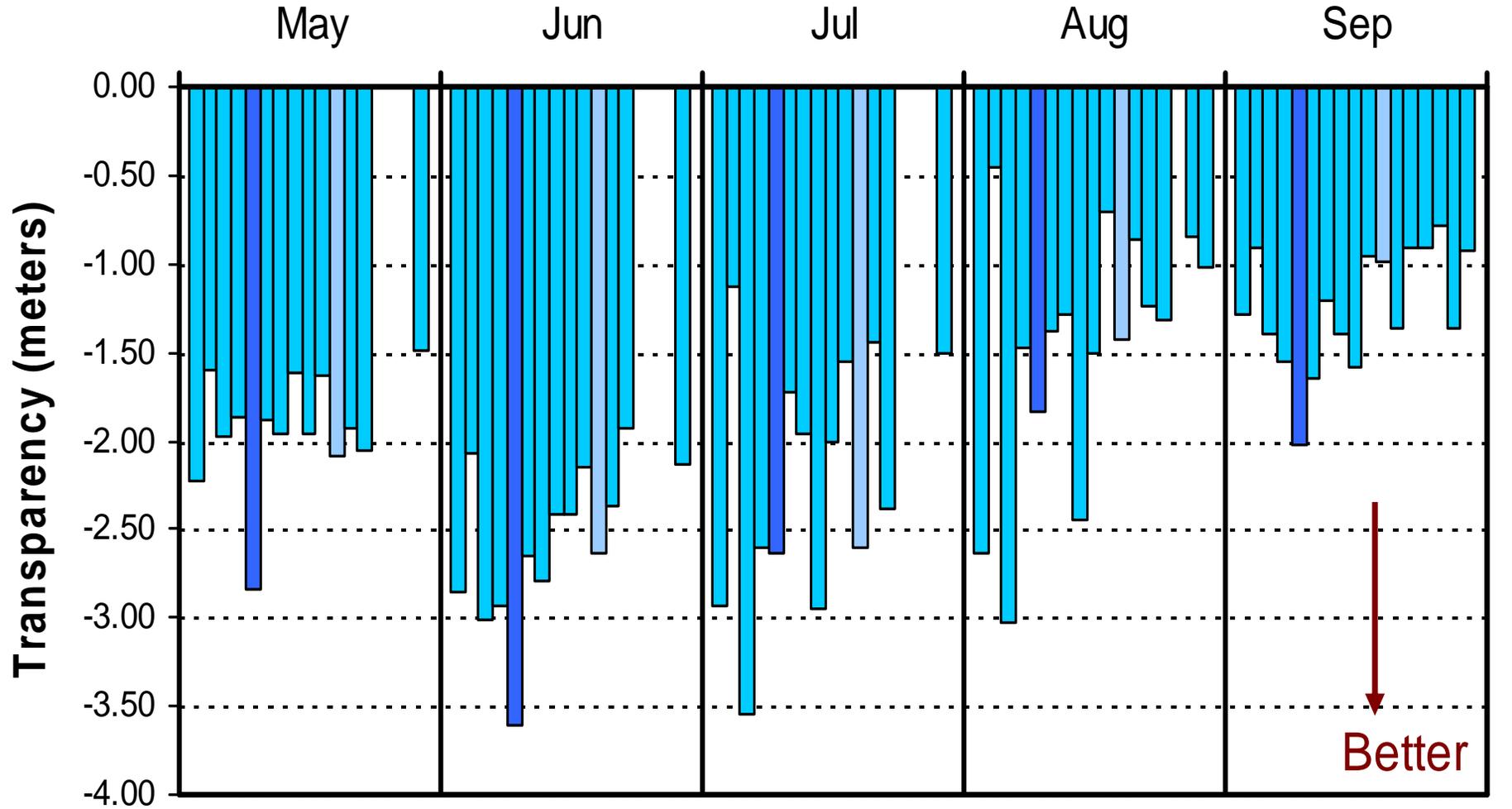


Transparency

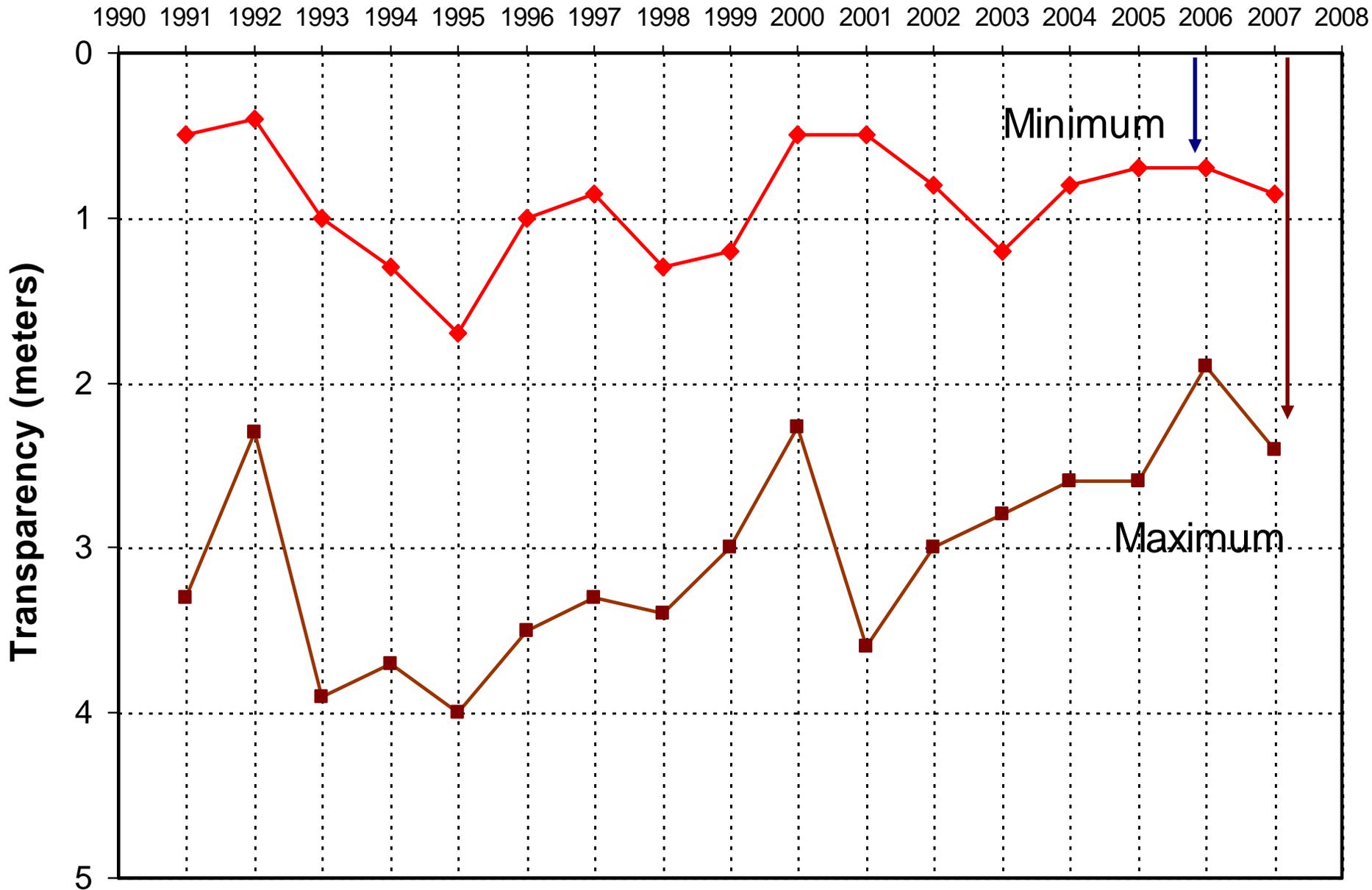
2007 compared to Pre 1990 data



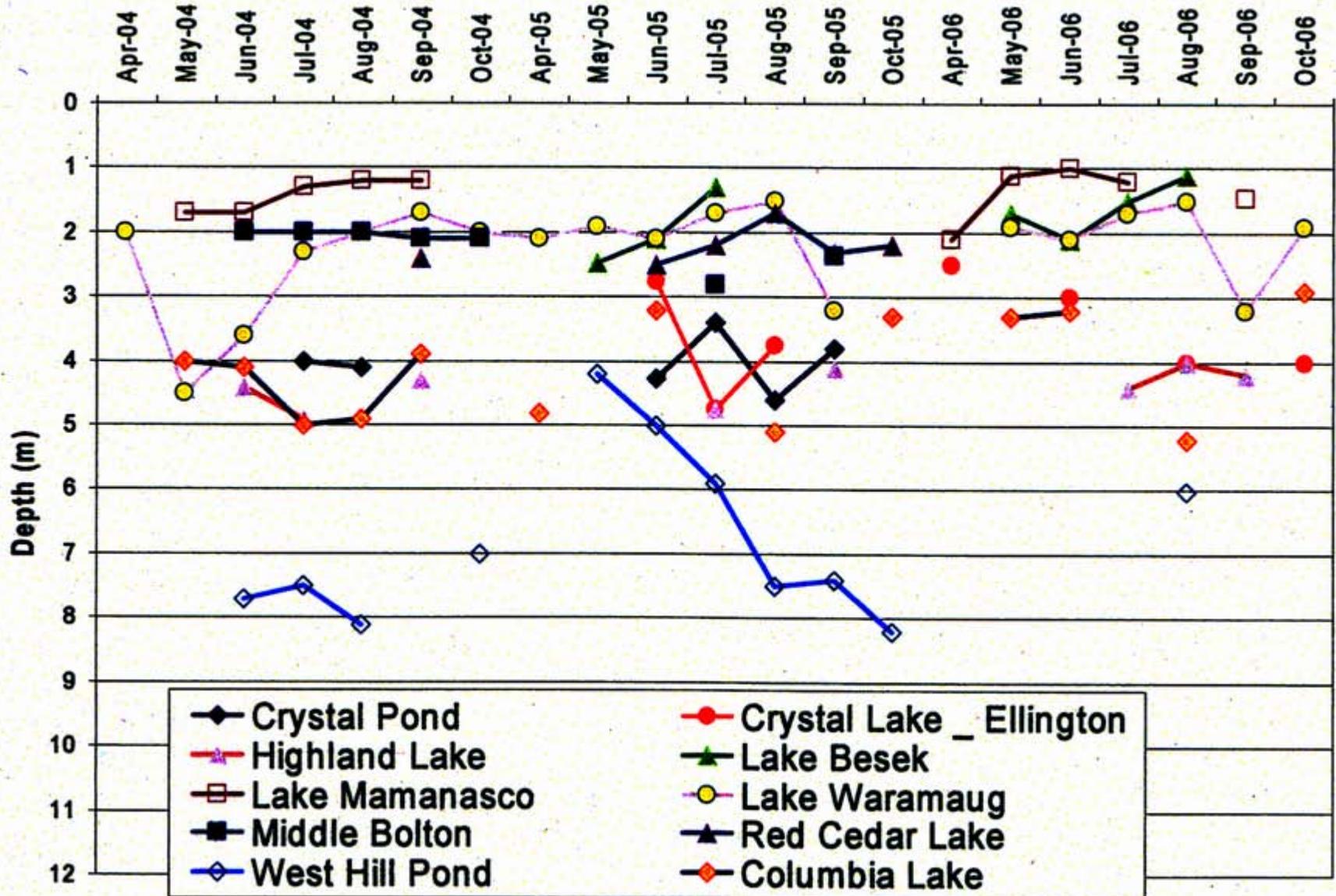
May - Sept Average Monthly Transparency 1991 - 2007



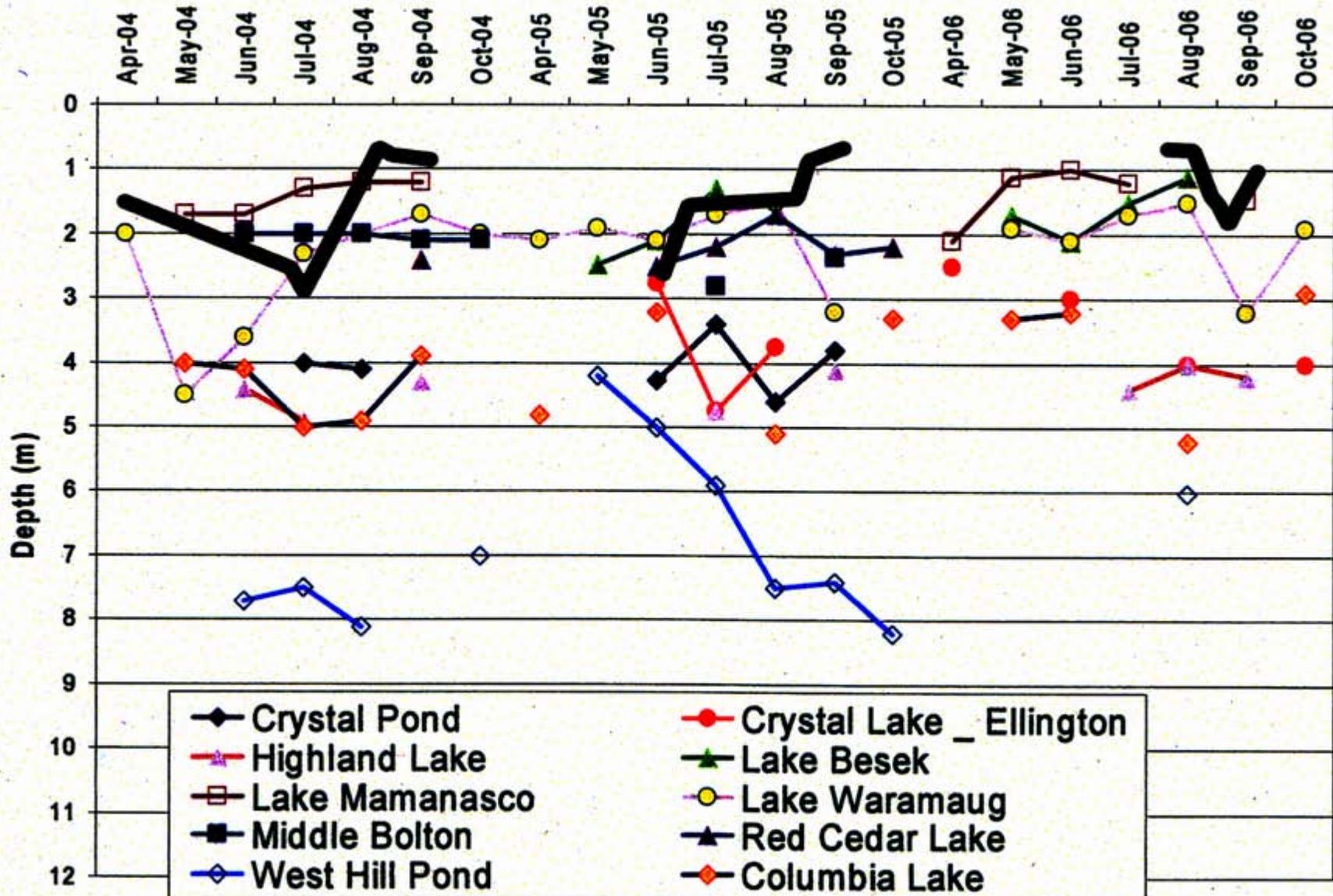
Minimum and Maximum Transparency 1991 - 2007



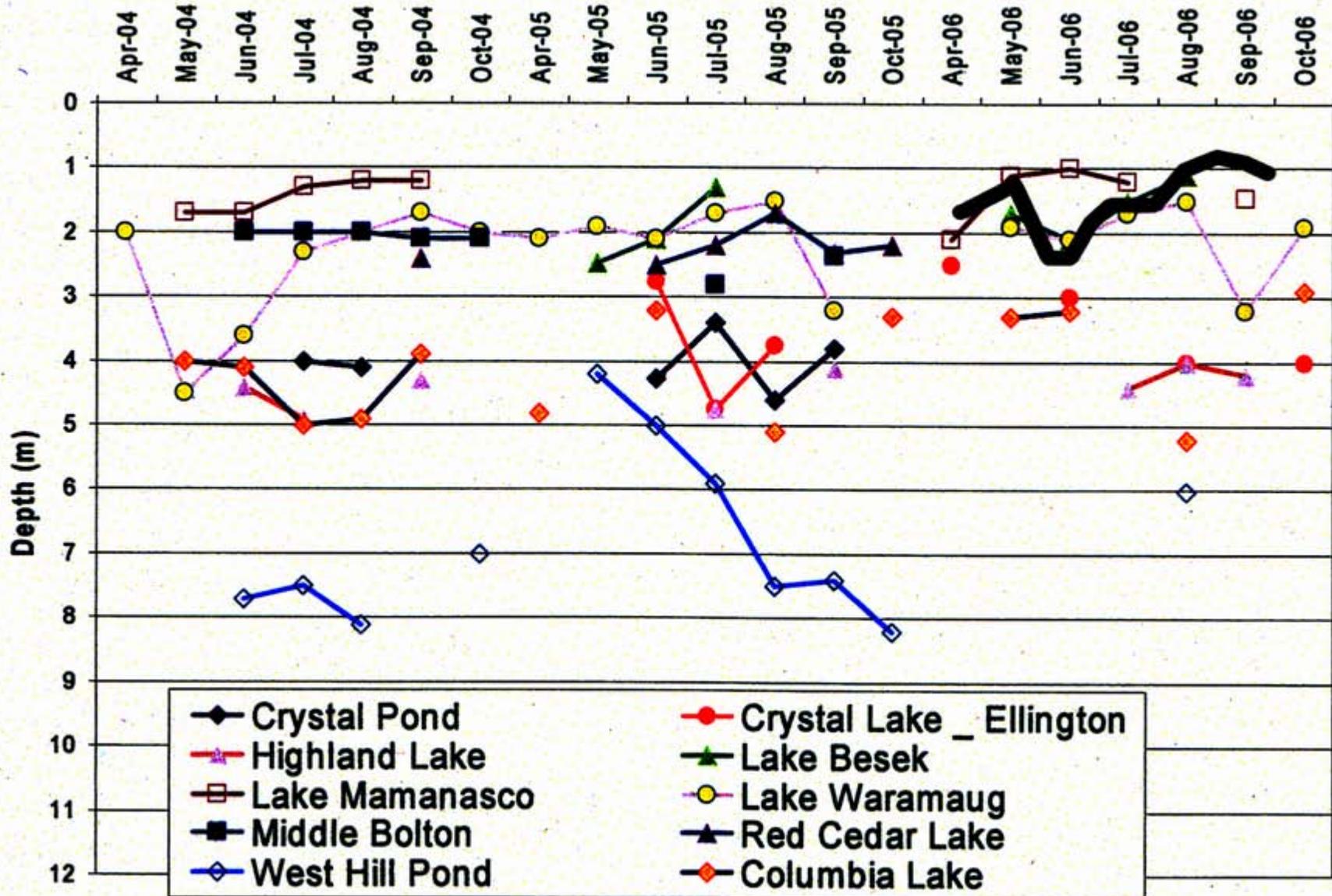
2004 - 2006 Secchi Disk Depth



2004 - 2006 Secchi Disk Depth



2004 - 2006 Secchi Disk Depth



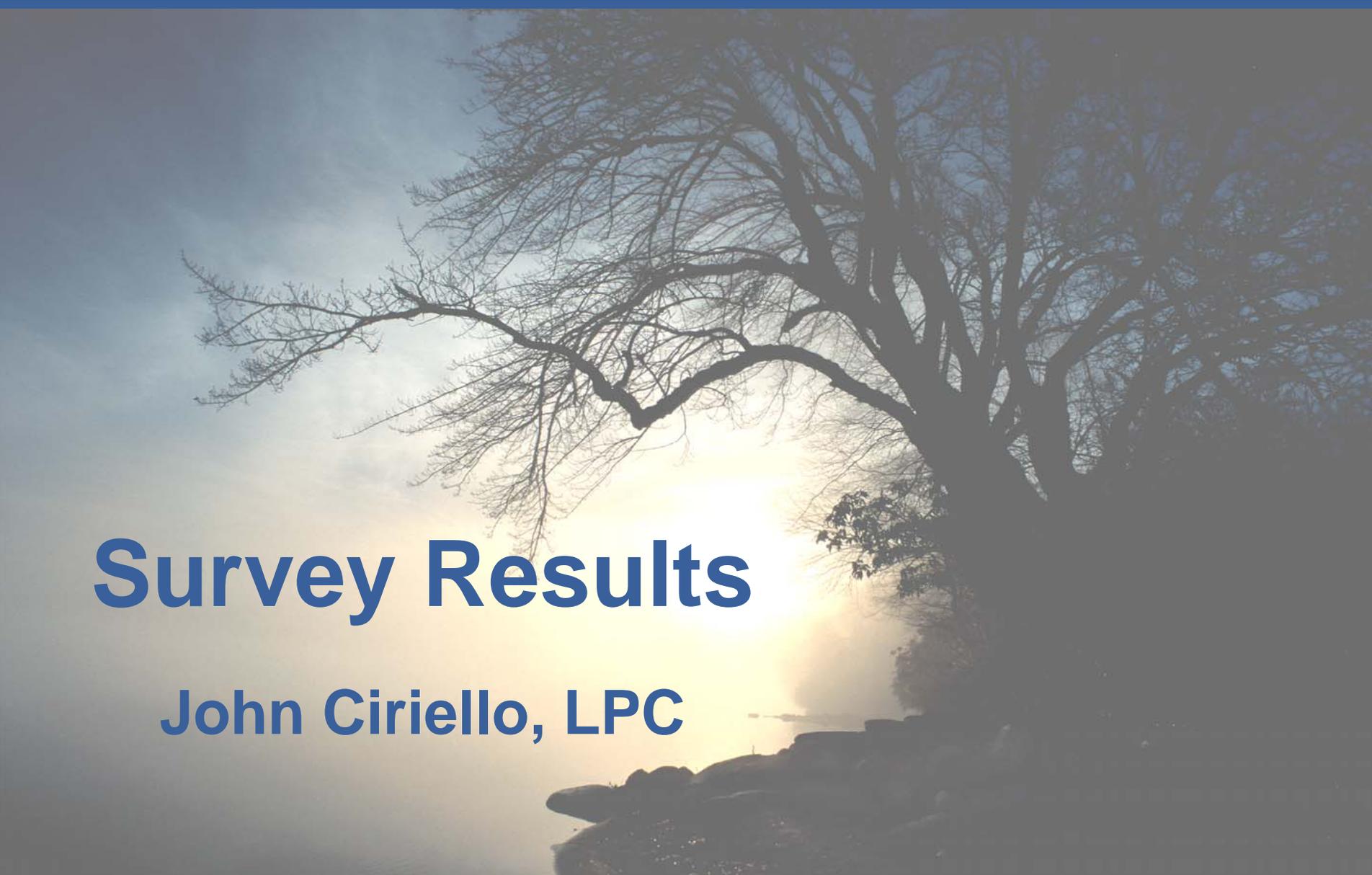
Summary

- **Bottom P was substantially reduced with the alum treatment of 2001**
 - Increased back to pre-treatment levels over ~3-4 years
- **Alum didn't appear to reduce Surface P**
- **Alum improved transparency in mid-summer 2001**
- **May 2007 transparency**
 - Poorest recorded for month of May over recorded period
- **Average Transparency June thru September**
 - Best in the mid 90's; Deteriorated steadily since then
- **Late summer bloom duration**
 - Increased since the early 90's

Survey Results – What Has the Commission Learned From the Survey?

Survey Results

John Ciriello, LPC



Survey Results – What Has the Commission Learned From the Survey?

- Survey Was First Lake Commission Project
- Mailed to 1250 Lake Watershed Residents
- 333 (32%) Residents Responded
- Major Problems Seen By Residents:
 - Phosphorus
 - Algae
 - Lack of Water Clarity

Survey Results – What Has the Commission Learned From the Survey?

- **How Do You Judge the Quality of Your Lake?**
 - Water Clarity (69%)
 - Clean Environment (17%)
- **Have You Noticed Water Quality Deterioration?**
 - Yes – Over the past 5 to 25 years (90%)
- **What Do You Believe Are the Problems?**
 - Algae Blooms (Green Scum) (68%)
 - Turbidity/Colored Waters (46%)

Survey Results – What Has the Commission Learned From the Survey?

- **What Has Caused the Most Significant Problems?**
 - Lawn Fertilizer Runoff
 - New Development Soil Erosion
 - Lakeside Roadway Pollutants
 - Excessive Phosphorus (due to all the above)
- **Do You Agree That Lake Pocotopaug Is “Impaired”?**
 - Yes! (78%)

Survey Results – What Has the Commission Learned From the Survey?

Would You Support a Town Ordinance Limiting Use of Phosphorus Fertilizers in the Watershed?

Yes! (94%)

Survey Results – What Has the Commission Learned From the Survey?

Survey Comments

“I grew up in Mallard Cove on the lake and I now live at Edgemere so I still see the lake often. Since I moved here at the age of 5, and I am now 24, I have seen the lake deteriorate. This includes odor, weeds, algae growth, fish kill, loss of clarity, just plain dirty and gross. I no longer will use the lake for any purpose because I am afraid I will end up sick from using it to swim, etc. I think it is beautiful, I just wish it was cleaner and better taken care of overall.”

Survey Results – What Has the Commission Learned From the Survey?

Survey Comments

“Shallow water, green water. Sediments carried by storm water runoff through storm sewers that discharge into the lake are infilling the lake, not to mention the water quality problems they cause. Roadway salt and sand are routinely discharged to the lake in the Winter and Spring through the storm drains; catch basins do not capture the bulk of the sediments. Road sweeping and storm drain clean-out must be completed often and prior to large storm events to prevent this from happening.”

Survey Results – What Has the Commission Learned From the Survey?

Survey Comments

“The algae problem in Lake Pocotopaug continues to worsen. It seems to start earlier and earlier each year. When the algae is in full bloom, the lake is very unappealing for swimming or any other activities.”



How Have Other Towns & Lake Associations Addressed These Problems: Hebron

Hebron

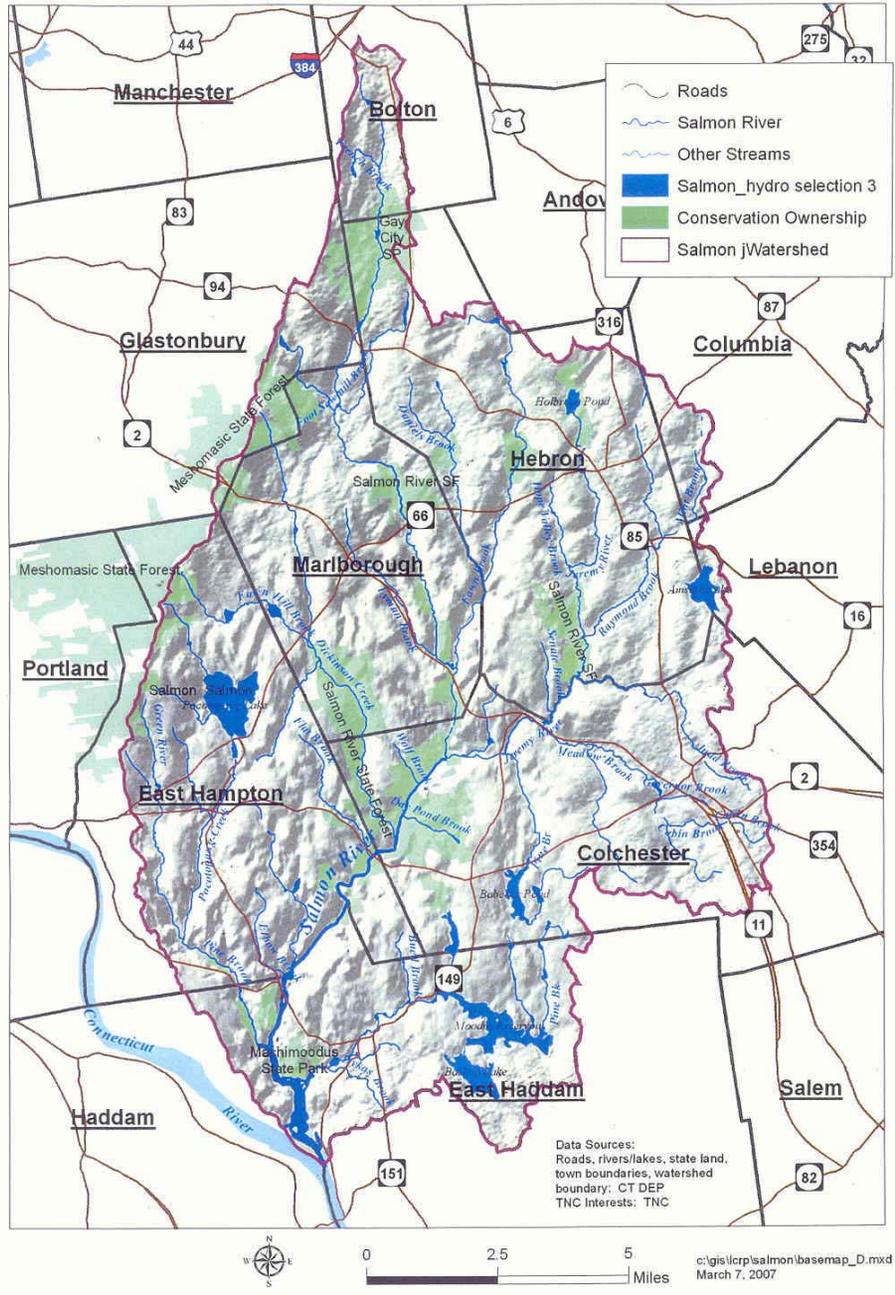
John Ciriello, LPC



How Have Other Towns & Lake Associations Addressed These Problems: Hebron

Hebron, CT

- Incorporated in 1708
- 37.5 square miles (24,000 acres)
- Population 8600
- Rural town
- Experienced significant residential growth in last 4 decades



How Have Other Towns & Lake Associations Addressed These Problems: Hebron

Plan of Conservation & Development Jan. 2004

■ Amston Lake Studies

- "The Environmental Team Report of Amston Lake 1985", provides useful base information on the lake and its watershed.
- "Environmental Impact of Additional Residential Development on Amston Lake", prepared for the Planning and Zoning Commission by Pare Engineering Corp in 1989 provides some of the basis for the Amston Lake District Zoning regulation provisions.

How Have Other Towns & Lake Associations Addressed These Problems: Hebron

Studies Showed:

- Direct relationship between uncontrolled development and environmental impact to the lake
- Over time, principle contributors of phosphorous to the lake have been identified as soil erosion, atmospheric fallout and septic systems
- Uncontrolled contributions in any of these categories can accelerate the premature aging of the lake

How Have Other Towns & Lake Associations Addressed These Problems: Hebron

Plan of Conservation & Development, continued...

- Establishes Goals & Objectives
- Goals of the Town Example
 - Establish/implement rigid site development standards in Amston Lake District & watershed
- Objectives Examples
 - Establish policy for min. lot size consistent with area
 - ...that serves to protect against ground water depletion
 - ...sustains natural life of Amston Lake

How Have Other Towns & Lake Associations Addressed These Problems: Hebron

- Objectives Examples, continued...
 - Maintain less than 10% impervious surface in all regional and sub regional watersheds
 - Maintain the maximum amount of vegetation on slopes greater than 15%
 - Restrict clear cutting in environmentally sensitive stream corridors.

How Have Other Towns & Lake Associations Addressed These Problems: Hebron

- Objectives Examples, continued...
 - Slow development in environmentally sensitive areas by restricting lot size.
 - Acquire the building rights of sensitive land so that watersheds and watercourses will be protected.
 - All of the above reduce phosphorus which, in turn, keeps Hebron's lakes and streams healthy.

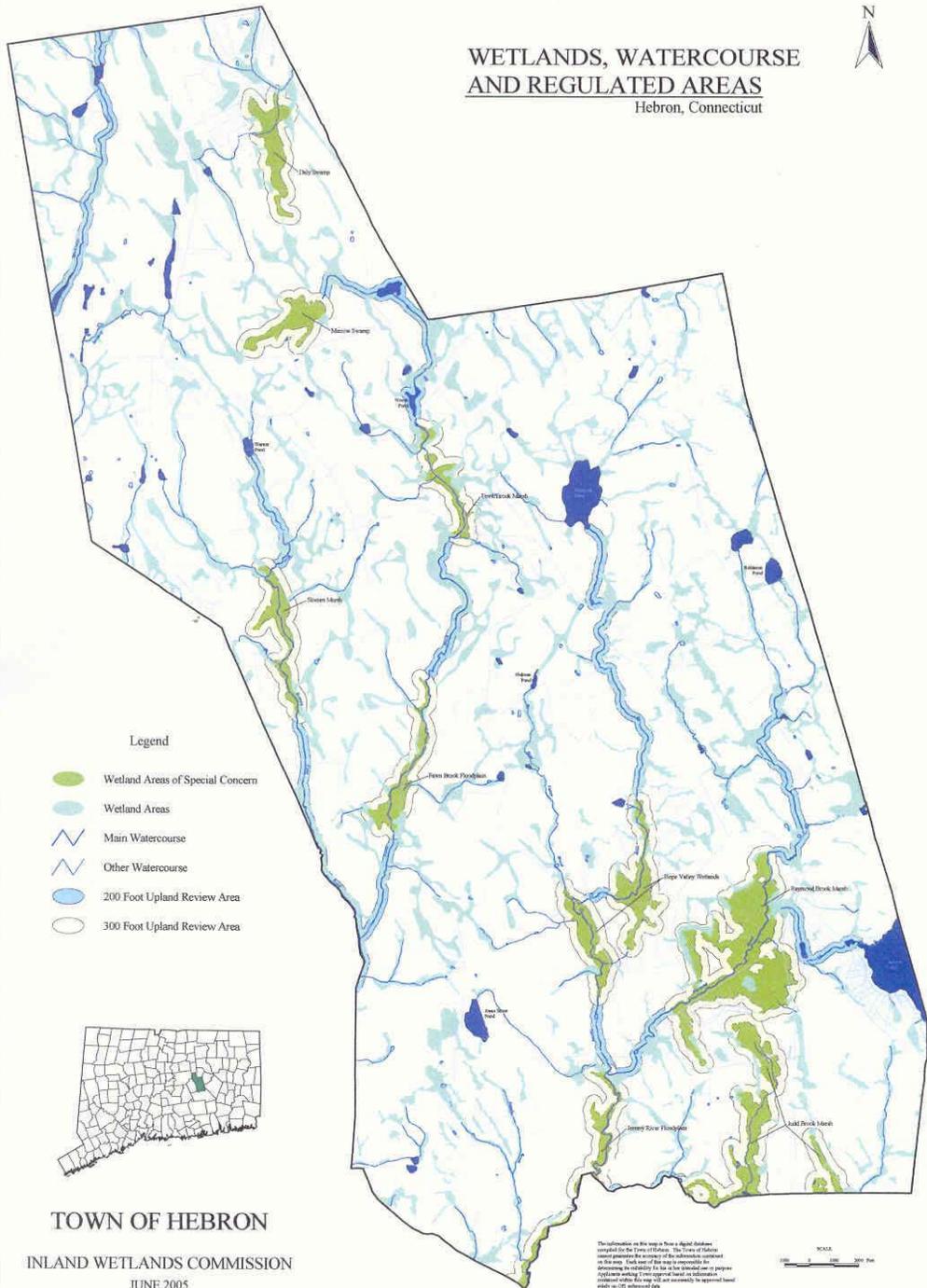
How Have Other Towns & Lake Associations Addressed These Problems: Hebron

Using the Plan of Conservation & Development

- Regulations are drafted, strengthened
- Regulations examples
 - Old: 5000 sq. ft. watershed lot unbuildable
 - New: 10,000 sq. ft. watershed lot buildable; Must conform to all building regulations
 - Buffer areas increased along watercourses and wetlands 200–300 ft, respectively
 - Restrict lot size, require up to 30% as open space

WETLANDS, WATERCOURSE AND REGULATED AREAS

Hebron, Connecticut



Legend

- Wetland Areas of Special Concern
- Wetland Areas
- Main Watercourse
- Other Watercourse
- 200 Foot Upland Review Area
- 300 Foot Upland Review Area

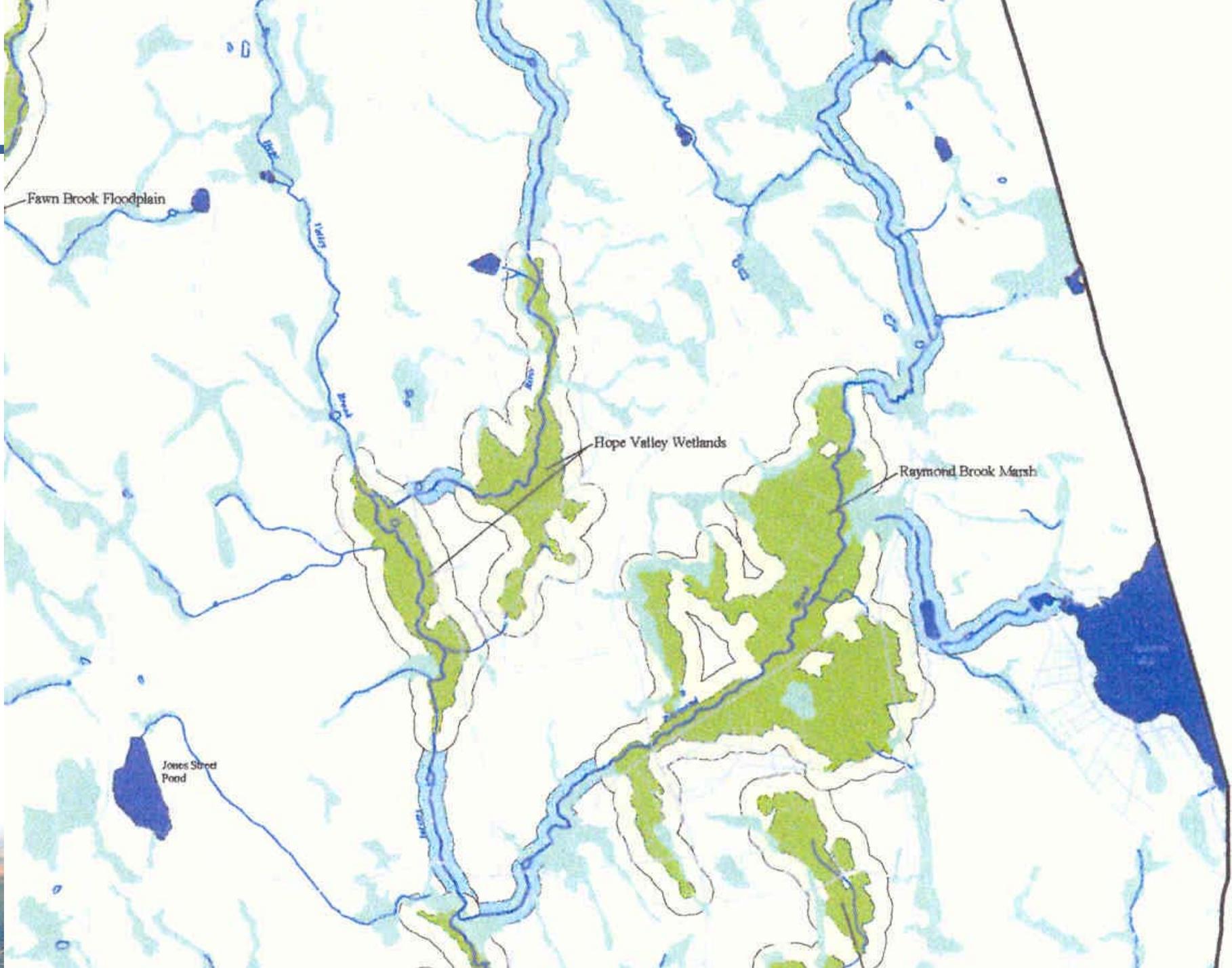


TOWN OF HEBRON

INLAND WETLANDS COMMISSION
JUNE 2005

The information on this map is from a digital database compiled for the Town of Hebron. The Town of Hebron cannot guarantee the accuracy of the information contained on this map. Each user of this map is responsible for determining the reliability of the information on this map. Applications of this map are based on information contained in the map files and are not intended to be approved or disapproved by the State of Connecticut.





Fawn Brook Floodplain

Hope Valley Wetlands

Raymond Brook Marsh

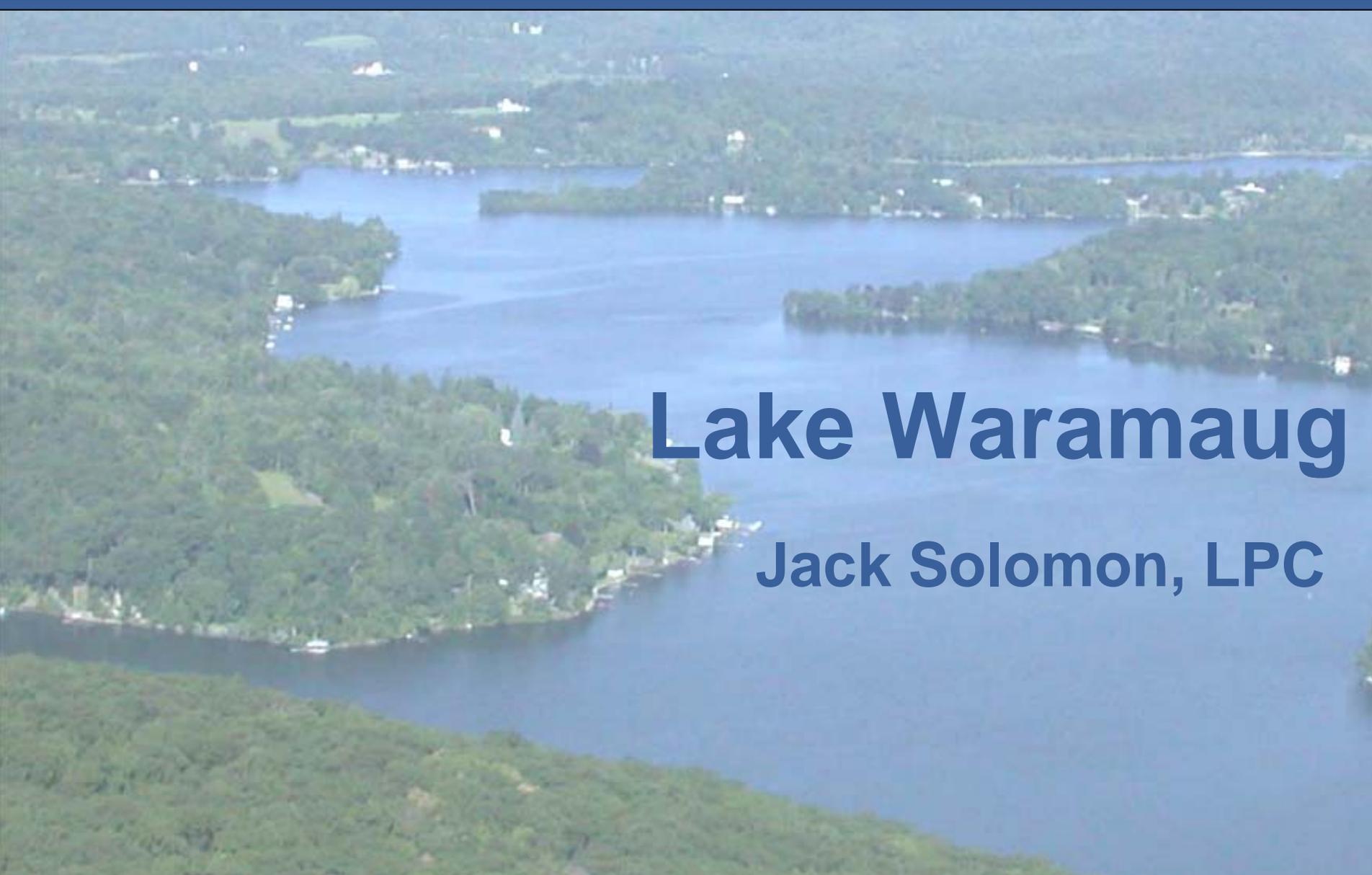
Jones Street Pond

How Have Other Towns & Lake Associations Addressed These Problems: Hebron

Summary

- Hebron Improved their Plan of Conservation & Development
 - Added protective Goals & Objectives
- They applied the Plan of Conservation & Development 'Goals & Objectives'...
 - To Draft and Adopt Protective Regulations
- Hebron has made substantial progress towards protection of lakes & watercourses

How Have Other Towns & Lake Associations Addressed These Problems: Lake Waramaug



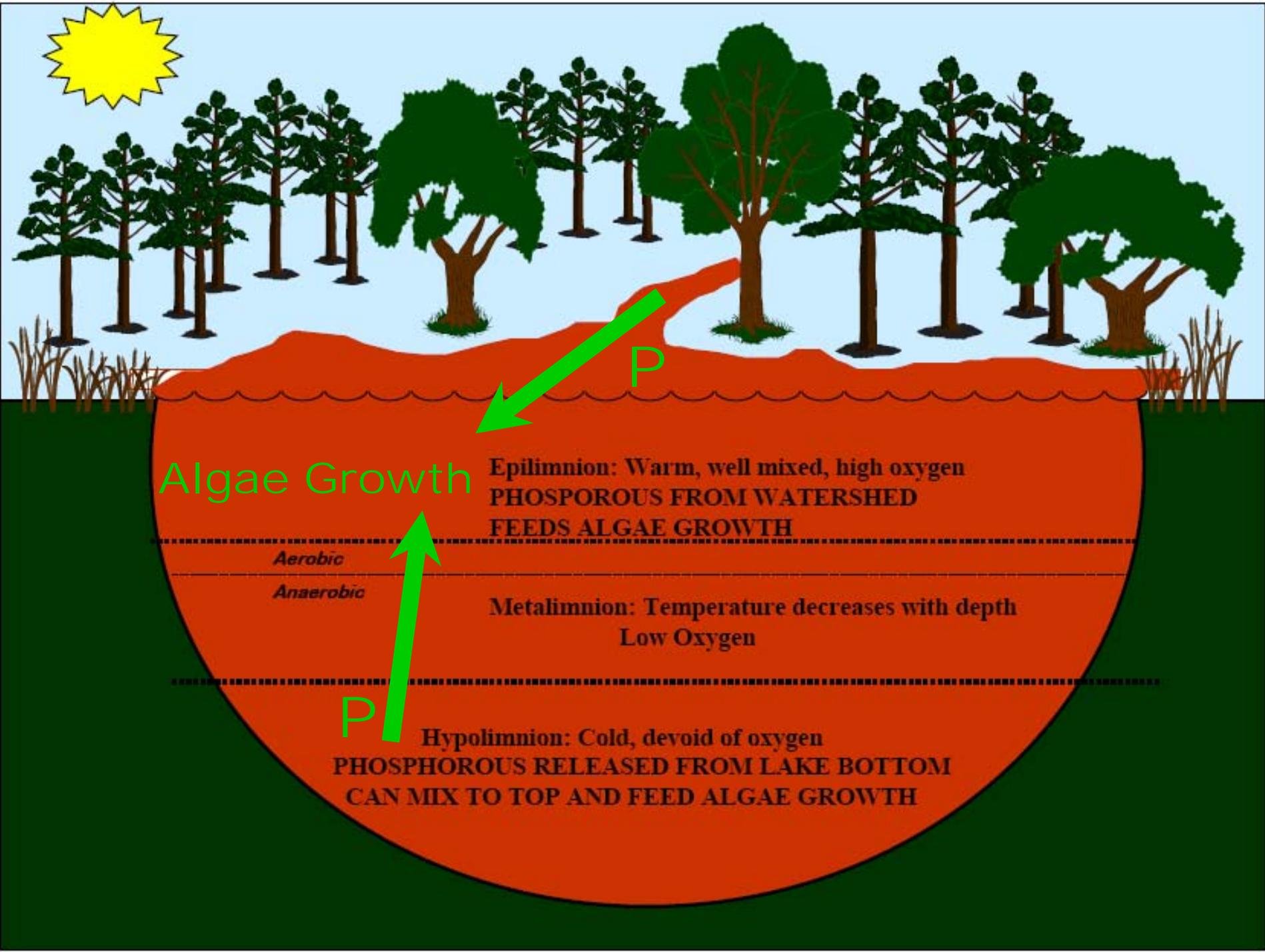
Lake Waramaug

Jack Solomon, LPC

How Have Other Towns & Lake Associations Addressed These Problems: Lake Waramaug

Lake Waramaug 1975

- Formed a task force in 1975
- Lake is in advanced stage of eutrophication
- “No Quick Fix”
- Phosphorous from watershed and internal loading is feeding explosive algae growth



How Have Other Towns & Lake Associations Addressed These Problems: Lake Waramaug

Objectives of Lake Waramaug Task Force

- Reduce flow of nutrients (especially phosphorous) from watershed to lake
- Reduce “Internal Loading” cycling of nutrients from lake bottom to surface
- Restore large (algae eating) zooplankton

How Have Other Towns & Lake Associations Addressed These Problems: Lake Waramaug

Actions of Lake Waramaug Task Force

- Reduce NPS Watershed Sources
 - Major erosion sites on feeder streams and park shoreline
 - Whole dairy farm waste collection & treatment system = 25% P reduction
 - Conversion of dairy to vineyard and wine waste lagoon

How Have Other Towns & Lake Associations Addressed These Problems: Lake Waramaug

Education Activities of Lake Task Force

- **Education and Regulation**
 - Newsletters, talks, “personal visits” on best management practices
 - Model demonstrations, e.g. Native landscape shoreline buffer as alternative to lawn
 - New Zoning Regulations for lake watershed and shoreline development

How Have Other Towns & Lake Associations Addressed These Problems: Lake Waramaug

In Lake Activities

- In-Lake Restoration
 - In-lake restoration systems reduce internal loading of phosphorus, improve habitat for zooplankton and brown trout and fix phosphorus to naturally available iron
 - Stock lake with brown trout to reduce excessive alewife population
 - Seed lake with zooplankton to help restore population

How Have Other Towns & Lake Associations Addressed These Problems: Lake Waramaug

Importance of Multiple Organizations

- How They Did It
 - Tremendous volunteer Task Force Board
 - Strong leadership and fundraising
 - Tiered organizational structure spreads the responsibilities
 - Task Force – Research and development
 - Inter-Local Commission – Operation cost
 - Lake Association – Support and education

How Have Other Towns & Lake Associations Addressed These Problems: Lake Waramaug

Lessons for Lake Pocotopaug

- Multiple organizations working together
- Focus on phosphorous and erosion control
- Supplement with in-lake restoration
- Professional guidance and support

How Have Other Towns & Lake Associations Addressed These Problems: Lake George

Lake George

Jack Solomon, LPC

How Have Other Towns & Lake Associations Addressed These Problems: Lake George

Lake George Association

- “People Protecting the Lake” Since 1885

- Quote from Executive Director

“...Lake George is a resource we hold in common. No individual has the right to harm it, and no individual alone can protect it entirely. But each of us can have a positive effect on its preservation.....”

How Have Other Towns & Lake Associations Addressed These Problems: Lake George

Lake George Association - West Brook Project

“Pollutants conveyed by stormwater runoff along this highly developed corridor have contributed over 50% of the pollution to the southern basin of Lake George. That is why we have made this project our highest priority. This is a once in a lifetime opportunity to make a truly significant improvement to our beloved lake. Reconstructed wetlands, retention basins and other stormwater treatment measures will trap sediment that has been contributing to the delta at the mouth of West Brook. This delta has been expanding at an alarming rate, due to clear-cutting and poor development practices in the upland areas.”

How Have Other Towns & Lake Associations Addressed These Problems: Lake George

Lake George Conservation Projects

- West Brook Project - Parcels of land to handle run off
- Foster Brook - Dredged and stabilized
- Hague Brook - Sediment pond
- Edmunds Brook – Stream bank stabilization
- Huddle Brook - Sediment retention pond
- Middle Brook Reservoir - Constructed in 2005, dredged in August of 2006

Land Use Management and Planning

All towns within the Lake George watershed that have adopted a Comprehensive Plan have identified that “preserving the beauty of Lake George and its hillsides...” is a top priority for their future. It is critical that increasing development in each community is in harmony with this collective vision. Those who make the decisions to shape the future, (homeowners, developers and town Planning Board and Zoning Board of Appeals members) manage the outcome.



Above: A vegetative buffer continues to grow after 3 years of plantings.

How Have Other Towns & Lake Associations Addressed These Problems: Lake George

Education and Outreach

- Training Sessions
- Monitoring
 - Frogs and Toads
 - Streams
 - Zebra Mussels
 - Turtles
- Stream Clean Ups
- Lake Awareness Room

How Have Other Towns & Lake Associations Addressed These Problems: Lake George

Lessons From Lake George

- Multiple Projects Are Required
- Cooperation Needed
 - Homeowners
 - Planning & Zoning Commission
 - Zoning Board of Appeal
 - Everyone

How Do Current Regulations and Practices Affect the Lake: IWWA

IWWA

Jeff Foran



How Do Current Regulations and Practices Affect the Lake: IWWA

- **No Phosphorous fertilizer ordinance (stressing the three components)**
 1. Ordinance
 2. Enforcement
 3. Education (most important)
- **IWWA revised No-P ordinance at 1/16/08 meeting**
 - Scheduled for vote at 1/30/08 meeting to send revised ordinance back to the Town Council

How Do Current Regulations and Practices Affect the Lake: IWWA

- Zero Net Nutrient Loading from new or re-development within the lake watershed
 - Preference to on-site reduction of nutrients
 - Will likely develop a formal policy
 - Having another workshop/special meeting in March '08 with Ken Wagner to set this up for our regulations

How Do Current Regulations and Practices Affect the Lake: IWWA

- Encourage innovative or less traditional stormwater management practices
 - Rain gardens
 - Wet basins
 - Treatment wetlands
 - Encourage natural plantings
 - Encourage more permeable surfaces (driveways, walks, etc.)

How Do Current Regulations and Practices Affect the Lake: IWWA

- The IWWA is also using 3rd party inspections on sites as they are being worked on
 - No charge to the town - developer pays for them

How Do Current Regulations and Practices Affect the Lake: P&Z Commission

P&Z Commission - Peter Aarrestad



How Do Regulations and Practices Affect the Lake: P&Z Commission

- **Historical factors:** (i.e. HOW WE GOT HERE)
 - (train station (late 1880s), resort development on lake, seasonal cottage construction on small lots, DEP mandates town to install sewers (late 1970s), availability of city sewers allows conversion to year-round homes on small lots)
- **Current factors:** (i.e. WHERE WE ARE NOW)
 - Zoning regulations and other regulatory tools (see following slides)
- **Future considerations:** (i.e. WHAT CAN WE DO TO PROTECT AND OR RESTORE THE LAKE?) refer to final slide and to Lake Commission recommendations

(NOTE: This presentation was developed by PZC member Peter Aarrestad and does not necessarily reflect the opinion of the PZC or the Town of East Hampton)

How Do Regulations and Practices Affect the Lake: P&Z Commission

Key Zoning tools (just scratching the surface)

- Section 7.12 – Lake Pocotopaug Protection Area
- (adopted 1996 (applies throughout lake watershed regardless of underlying zoning designation))
- 7.12.1 - Purpose
- This regulation is to **provide special protection to all land included in the watershed of Lake Pocotopaug.** It shall reduce the negative environmental effects of development in this area.
- 7.12.2 - Scope
- All uses requiring Subdivision, Site Plan or Special Permit approval shall be subject to this regulation. **A public hearing will be required for all applications under this section.**

Section 7.12 – Continued

All proposals shall show that specific and adequate measures have been taken to: (selected examples)

- Reduce erosion and sedimentation during and after construction.
- Promote the removal of sediments and nutrients in stormwater.
- Limit the area of disturbance.
- Avoid slopes in excess of 20%.
- Protect native vegetation.
- Ensure that post development peak rates and volume of stormwater runoff do not exceed predevelopment levels.
- Promote infiltration of stormwater.

Section 7.12 – Continued

...Some of the techniques recommended in the design of proposals in this zone (selected examples)

- Use of slotted or perforated pipe.
- Use of vegetated swales in lieu of piped drainage.
- Use of storm water recharge basins.
- Treatment of first flush. Systems should be capable of treating the first 1" runoff.
- Use of porous pavements.
- Use of bioengineered mulches, mats and rolls. Avoidance of steep slopes. SCS, DEP, etc.
- Use of phasing to minimize disturbed area.

Other PZC considerations/issues

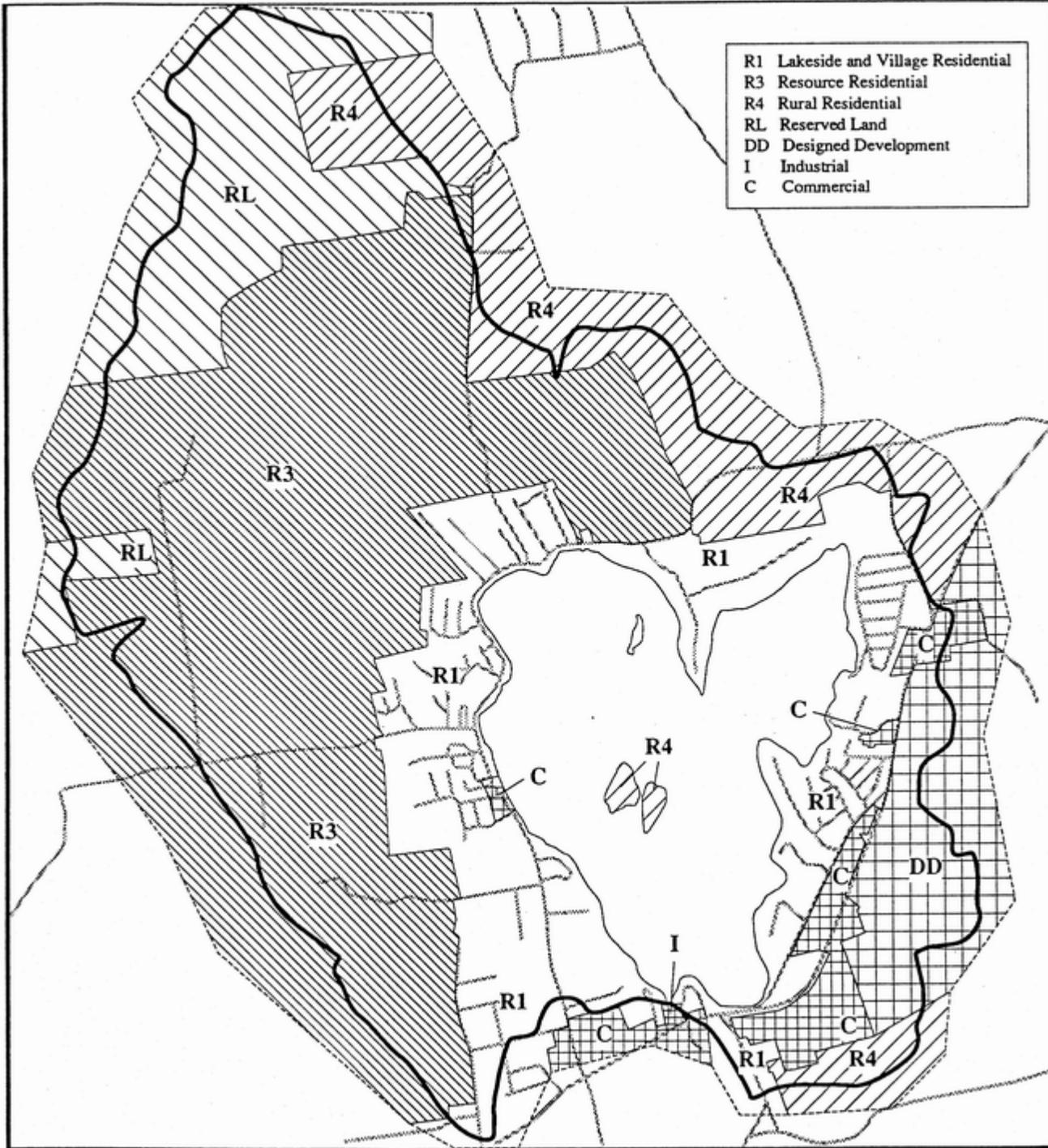
- Zoning Designations (i.e., required lots sizes, maximum impervious cover allowances, allowable uses, etc)
- Open space protection through the Subdivision regulations
- Housing Opportunity Development Zone (Sect 7.11)

(IMPORTANT ISSUES THAT ARE NOT ADDRESSED IN FOLLOWING SLIDES)

- Expansion of City Sewer system and others utilities
- Town Road requirements (i.e. impervious cover issues, stormwater management, and transportation capacity)
- Stormwater management (during and after construction)
- Variances by the ZBA

Watershed Zoning

(CITATION for
MAP)



SECTION 6 - GENERAL ZONING REGULATIONS

6.1 - Lot and Building.... Requirements

Minimum Lot Area (sq feet)

<u>ZONE</u>	<u>(W/out sewer)</u>	<u>(With Sewer)</u>
R1	60,000	20,000*
R2	60,000	40,000*
R3	65,000	45,000*
R4	85,000	85,000
C	40,000	40,000
I	40,000	40,000
DD	217,800 (5 acres)	217,800 (5 acres)

*(NOTE SEWER DENSITY BONUS)

SECTION 6 - GENERAL ZONING REGs (Cont.)

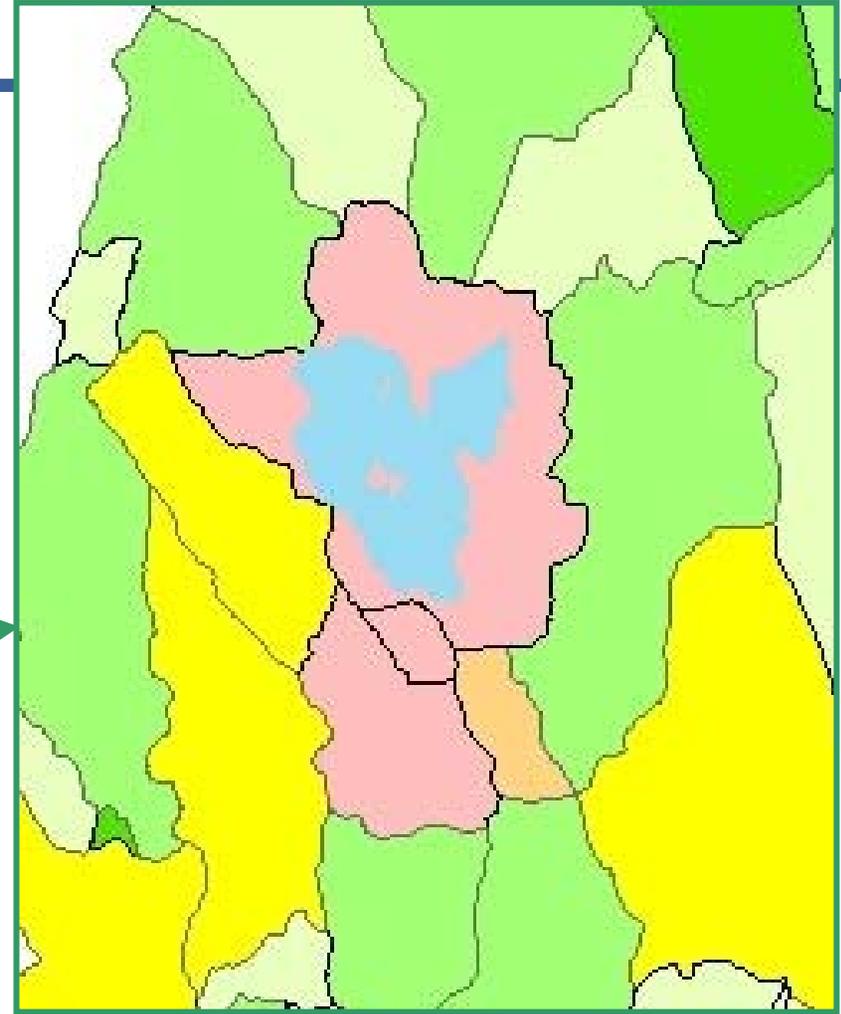
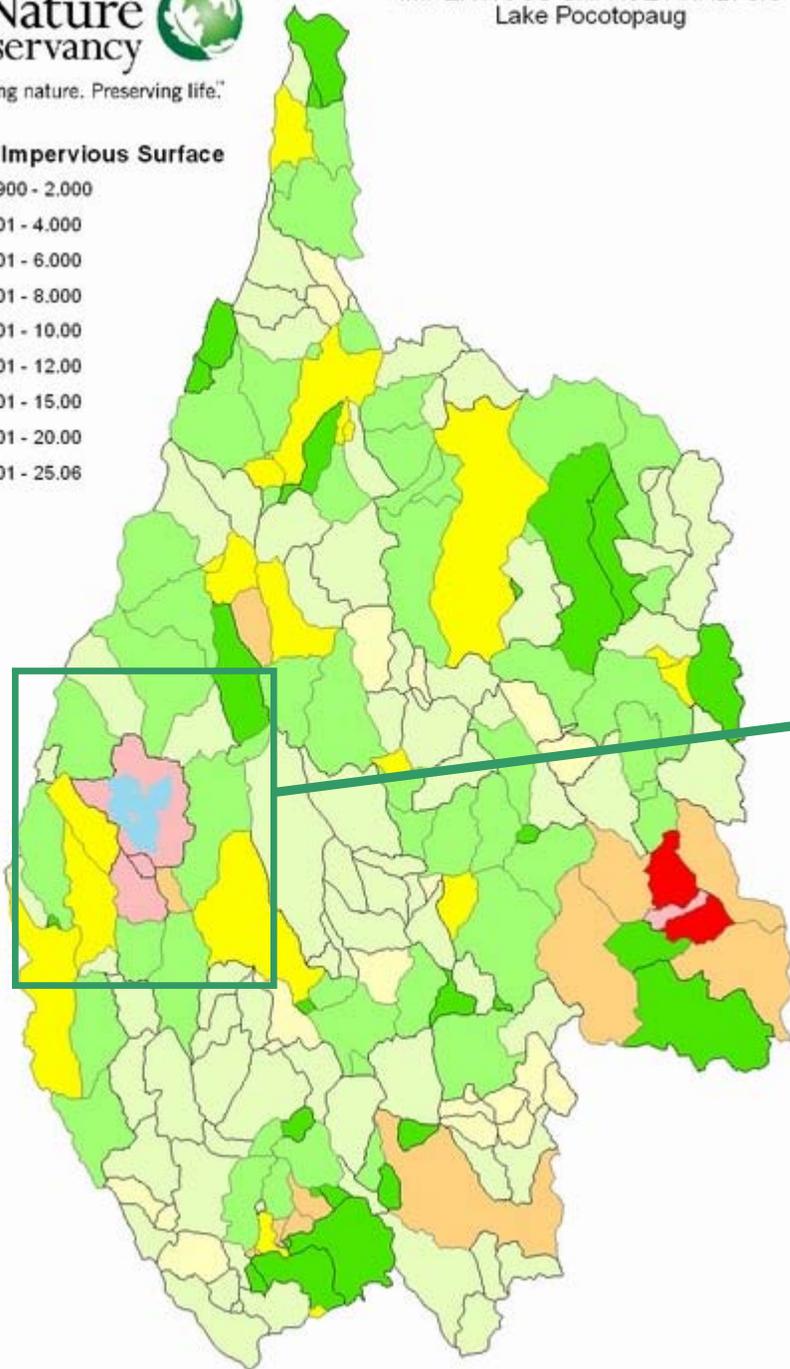
6.1 - Lot and Building Area and Dimensional Requirements (Cont.)

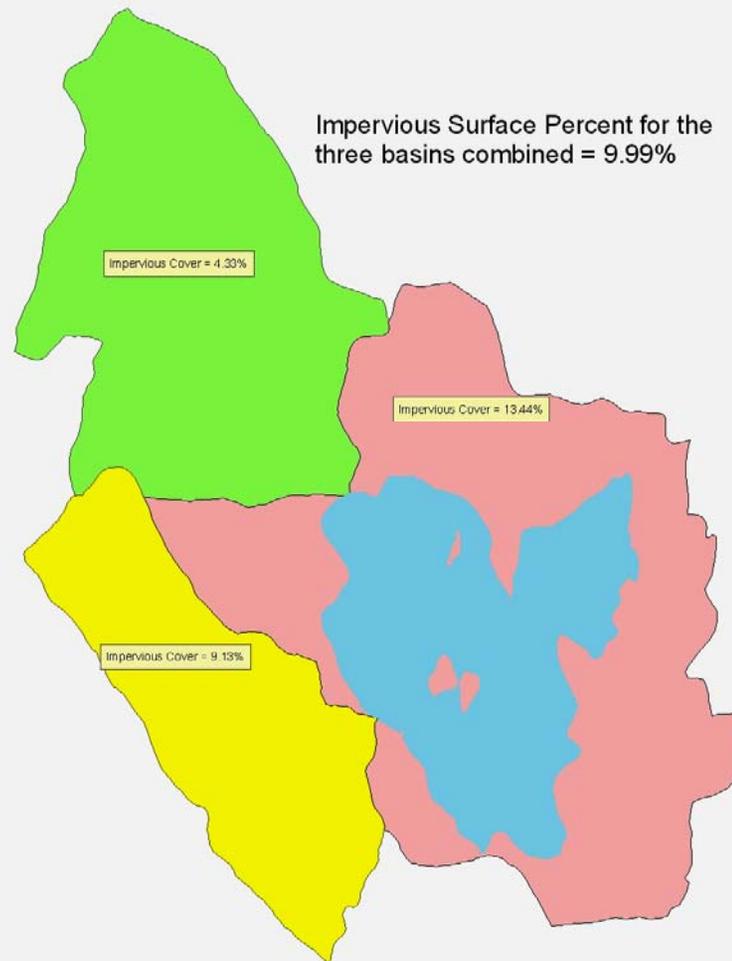
Maximum Lot Coverage (i.e. % maximum impervious surfaces)

<u>ZONE</u>	<u>(W/out sewer)</u>	<u>(With Sewer)</u>
R1	10	20
R2	10	10
R3	10	10
R4	10	10
C	60	60
I	50	50
DD	50	50
HOD*	25	25

* The HOD zone is essentially a floating zone that can be applied to a parcel of land upon approval of the PZC.

Percent Impervious Surface





SECT. 30 - CONSERVATION SUBDIVISION (Effective 1/12/04)

- Sec. 30.1 - Findings: The Commission finds that in some cases the strict adherence to traditional land development and subdivision techniques within the Town of East Hampton has resulted in:
 - The consumption of areas containing valuable recreational, agricultural, forest and other unique natural resources:
 - The construction of extensive roads and other improvements requiring maintenance by the Town of East Hampton:
 - The development of sites without specific consideration of the limitations of, or opportunities offered by, the existing topographical and soil conditions: and
 - The destruction of significant historic sites, geological features, severe slopes, scenic vistas, significant stands of trees, water courses, wetlands, wildlife habitat or other areas of environmental value, natural beauty or historic interest.

(*Commentary: Regulation created to provide design flexibility to promote protection of natural features and resources and to better preserve important open space.)

- **Sec. 30.7 - Open Space and Development Restriction:**
- Purpose: To preserve open space in the Town of East Hampton in order to maintain the rural character of the Town. Also to provide for and encourage a village type subdivision as an optional living environment.

Required Open Space: ... **40%** of the total parcel. (By comparison, a conventional subdivision requires 15% of the total parcel to be designated as open space).

(*Commentary: The discretion to apply for a Standard or Conservation Subdivision currently rests with the applicant.

Section 7.11 – Housing Opportunity Development Zone (effective 11/13/06)

- **Section 7.11.1 – Intent and Purpose***
- This regulation is adopted for the following purposes (incomplete list):
 - A. To allow, on a long-term basis, for the development of diverse housing types, including affordable housing to help address identified housing needs;
 - B. To encourage the construction of housing that is both affordable as defined by state statutes and is consistent with design and construction standards present in the community;
 - C. To promote housing choice and economic diversity, including housing for low and moderate income households.....

(*Commentary: Regulation created to help town conform to Chapter 126a (AFFORDABLE HOUSING LAND USE APPEALS) of the CGS's (i.e., CGS Sect. 8-30g and 8-30h)).

Section 7.11 – Housing Opportunity Development Zone (Continued)

A few selected provisions of Section 7.11

- All applications first require rezoning to the HOD District.
- Maximum Coverage by Impervious Surfaces = 25 percent
- Within the Lake Pocotopaug Watershed, applications are subject to Section 7.12 of the Zoning Regulations.

(For more information refer to Sect 7.11 of the Zoning regulations. The regulations are far too extensive to do them justice within this presentation)

Future Considerations

(A few suggestions to help get started)

- **Zoning-** consider rezoning selected areas within the lake watershed to better control increases in impervious cover
- **Town Road requirements-** review and revise standards as appropriate to better control nutrient management.
- **Put more teeth** (i.e. performance standards/criteria) into Zoning Regulation Section 7.12 (Lake Protection Area)
- **Develop nutrient standards** for all new development for incorporation into Zoning Regulation Section 7.12 (Lake Protection Area) or IWWCA regulations.
- **Improve management of stormwater** within previously developed areas and ensure only state of the art systems are employed in all future development.
- Eliminate the **Sewer Density bonus**
- Encourage or require **Conservation subdivisions** in the lake watershed.
- **Inform ZBA** of the unintended environmental effects of granting certain variances.

What Are the Next Steps For Our Town? Lake Pocotopaug Commission

Next Steps

Bob Hart, LPC



What Are the Next Steps For Our Town? Lake Pocotopaug Commission

Lake Pocotopaug Commission Ordinance

Section 2 – Purpose and Goals

“The goal of the Commission shall be to provide a Lake and Watershed Management Plan that protects the environmental aspects of the Lake ecosystem and watershed area, improves water quality, and ensures appropriate ongoing maintenance and monitoring...”

What Are the Next Steps For Our Town? Lake Pocotopaug Commission

Create a “Lake & Watershed Management Plan”

- Established “Lake Management Planning Committee”
- Work with lake consultant ENSR and state D.E.P.
- Engage town council, boards, commissions, agencies, departments, public in planning & implementation process
 - Hold conferences, conduct working meetings
 - Provide information; Solicit input; Secure consensus

What Are the Next Steps For Our Town? Lake Pocotopaug Commission

Goals of the Plan

First, a quick summary of causes...



What Are the Next Steps For Our Town?

Lake Pocotopaug Commission

- **What Causes a Green Lake?**
 - Excessive algae
- **What Causes Algae Growth?**
 - Phosphorus in lake (limiting factor)
- **Where Does Lake Phosphorus Come From?**
 - Atmosphere (dust content), soils, fertilizers, wildlife
 - External Sources (Primary): P loading from watershed
 - Internal Sources (Secondary): P release from lake bottom

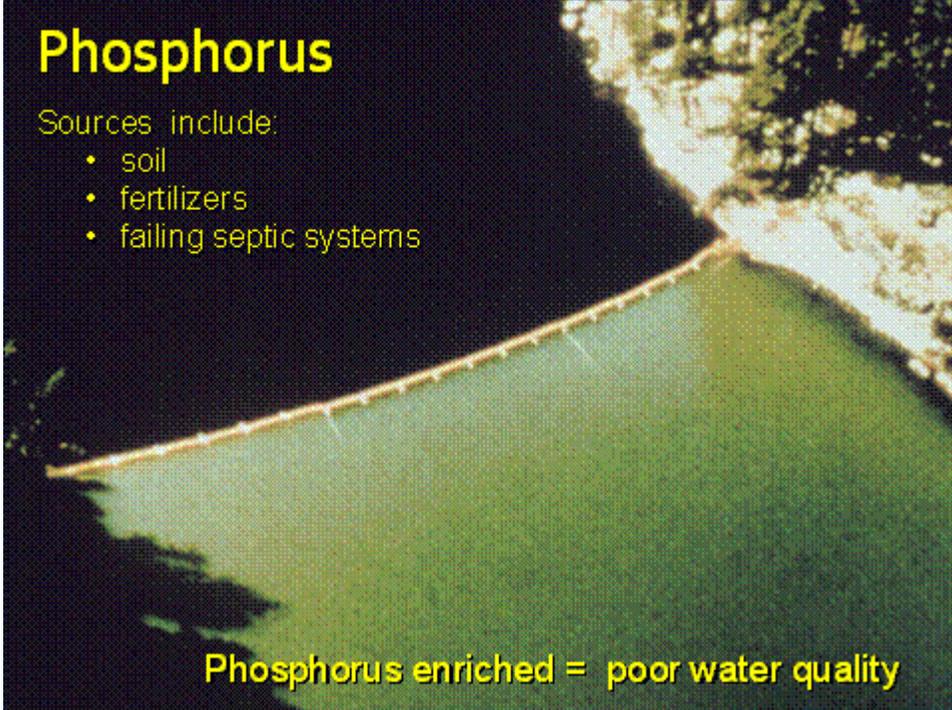
What Are the Next Steps For Our Town?

Lake Pocotopaug Commission

- **What Causes External P Loading?**
 - Removal of natural vegetation, which retains P
 - P-laden runoff from impervious surfaces
 - Roofs, driveways & walkways
 - Roads & sidewalks
 - Lawns (fertilizers with P content)
 - Silted turbid water from soil erosion
 - Transport paths for stormwater into lake
 - Streams & storm drains
 - Greater than 5-10% lot coverage in watershed

What Are the Next Steps For Our Town?

Lake Pocotopaug Commission

An aerial photograph of a lake showing a large, dense green algal bloom that has spread across a significant portion of the water's surface. The bloom is a vibrant green color, contrasting with the darker water. The shoreline is visible on the right side of the image.

Phosphorus

Sources include:

- soil
- fertilizers
- failing septic systems

Phosphorus enriched = poor water quality

What Are the Next Steps For Our Town? Lake Pocotopaug Commission

Goals of the Plan



What Are the Next Steps For Our Town?

Lake Pocotopaug Commission

- Reduce external phosphorus loading from watershed to lake from existing and future sources
 - From ~750 lbs/year to <250 lbs/year
 - Reduce existing P sources from developed areas
 - Phosphorus fertilizers, impervious surfaces, soil erosion, road maintenance practices, etc.
 - Remove phosphorus from streams & storm drains
 - Infiltration basins, settling ponds, treatment stations, etc.
 - Prevent added phosphorus loading from new watershed development

What Are the Next Steps For Our Town?

Lake Pocotopaug Commission

Goals of the Plan, continued...

- Reduce internal phosphorus loading from lake bottom sediments into water column
 - Alum treatment (only after external loading is reduced)
 - Near shore speed limit enforcement
 - Dredging
- Consider in-lake water treatment techniques
 - Aeration, circulation, ultrasound, etc.

What Are the Next Steps For Our Town? Lake Pocotopaug Commission

Goals of the Plan, continued...

- Continued lake & watershed monitoring to track progress
- Strategies for funding
- Strengthen Plan of Conservation & Development for lake protection

What Are the Next Steps For Our Town? Lake Pocotopaug Commission

Goals of the Plan, continued...

- Amend land-use regulations as needed: Zoning, IWWA
 - Address phosphorus reduction issues
 - Enhance stormwater Best Management Practices to reduce P sources and transport to lake
 - Minimize impervious surfaces; Enhance buffer requirements; etc.
- Educate public about problems and solutions

What Are the Next Steps For Our Town? General Discussion

A wide-angle photograph of a vast, flat, snow-covered landscape. In the foreground, there are several sets of tracks, likely from a snow machine or a similar vehicle, leading from the bottom left towards the center. The snow is bright white with some shadows and textures. In the distance, a small town or village is visible, with several buildings and a line of trees. The sky is a clear, pale blue. The overall scene is serene and quiet.

General Discussion

Lake Pocotopaug Conference

A wide-angle photograph of a sunset over a large body of water, likely a lake. The sky is filled with dramatic, layered clouds in shades of deep red, orange, and purple. The sun is low on the horizon, creating a bright glow that reflects on the water's surface. The water appears to be partially frozen or very still, with some ice visible in the foreground. In the background, a dark silhouette of a forested shoreline is visible. The overall mood is serene and beautiful.

Thank You