

Lake Winnepesaukee Watershed Management Plan



Project Update: September 2010

A Phased Approach to a Comprehensive Plan

People in Partnership with Lake Winnepesaukee

Partners

- Lake Winnepesaukee Watershed Association
 - Lakes Region Planning Commission
 - North Country Resource Conservation & Development Area Council
 - Belknap County Conservation District
 - University of New Hampshire Center for Freshwater Biology & Cooperative Extension
 - Plymouth State University – Center for the Environment
 - NH Dept. of Environmental Services
 - Municipalities
 - Other Organizations
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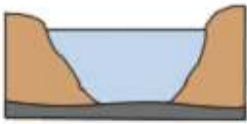
Funding

- NH DES – 319 Program
 - NOAA – Watershed Planning
 - Water Quality Monitoring
 - Town of Meredith
 - City of Laconia
 - Town of Gilford
 - Plymouth State University – Center for the Environment
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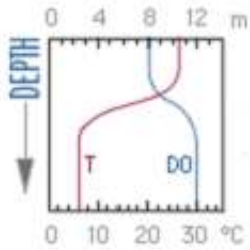
Why develop a Lake Winni WMP?



What are the key components of a watershed management plan?



Physical Features



Chemical Features



Lake Biology



Watershed Management

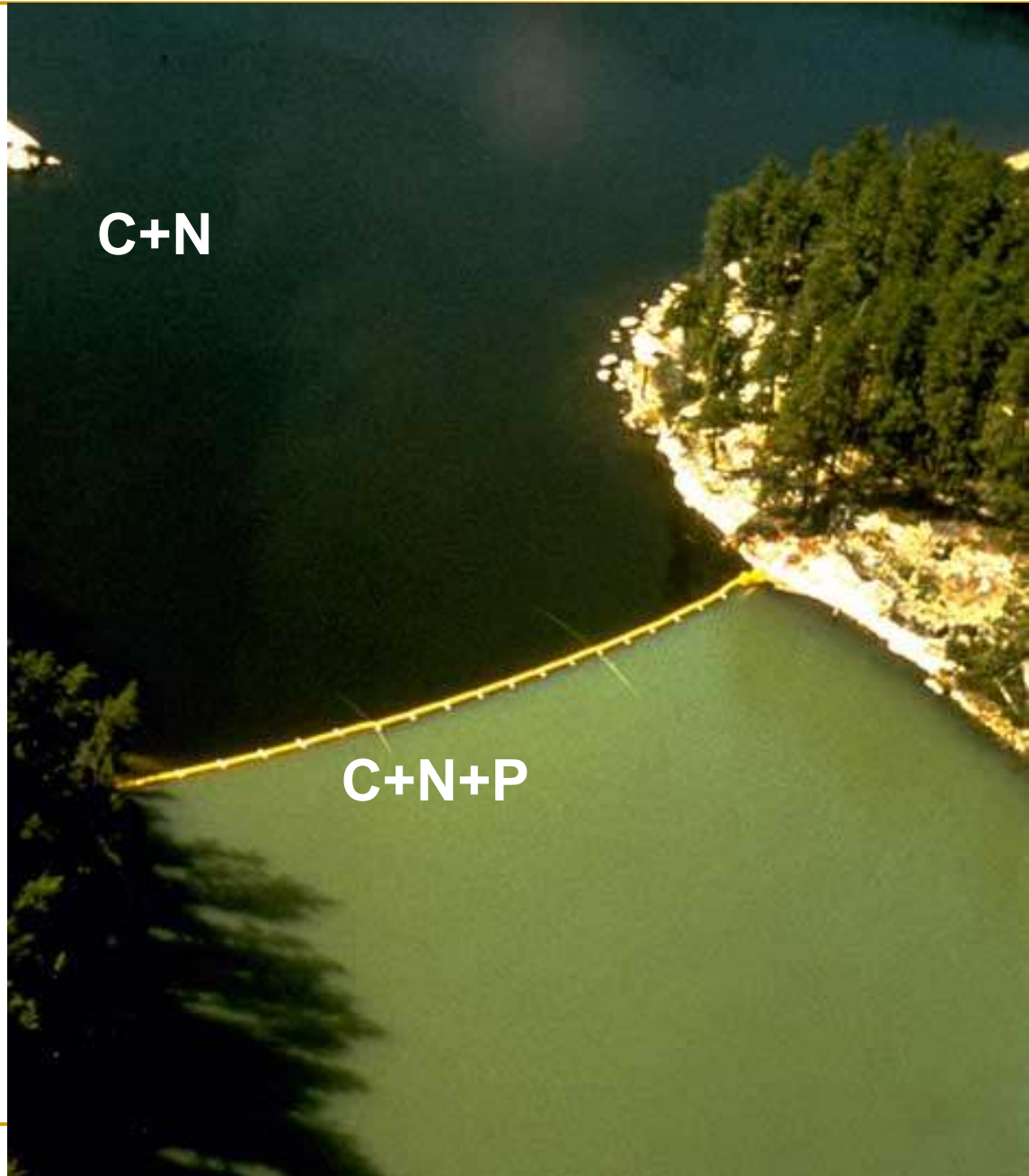
**Lake
Winnepesaukee
Watershed
Management
Plan**

Primary concern is watershed phosphorus loading and its impact on lake water quality.



**Phosphorus:
Important
Limiting
Nutrient**

From: Schindler
ELA, Ontario CA
1973



Why Phosphorus?



Milfoil



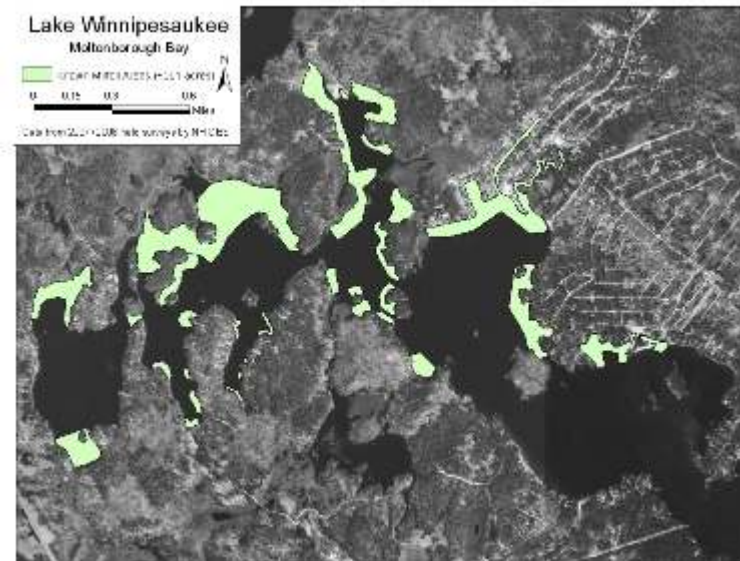
Algal blooms (including cyanobacteria)



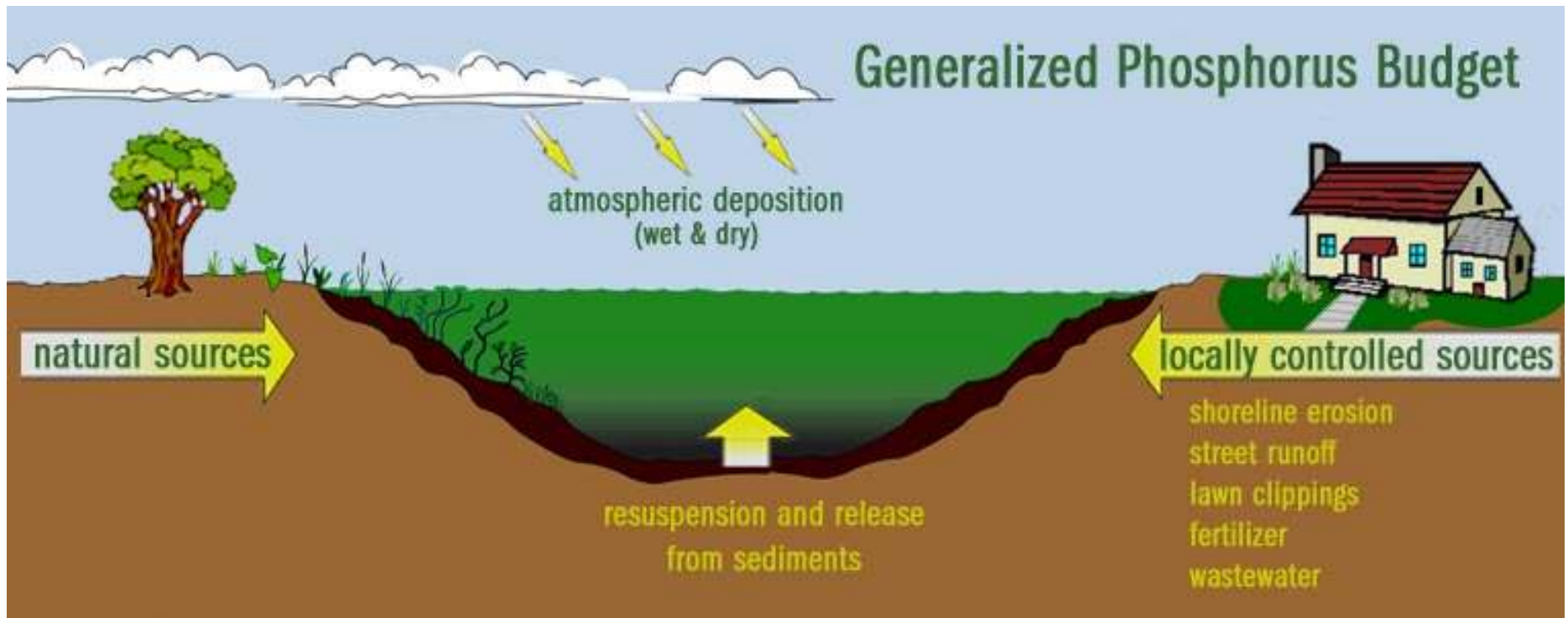
Increased levels of P may result in



- Decline in swimming, fishing and boating use
- Public health risk
- Decline in property values
- Increase in public expenditures to address water quality impairment



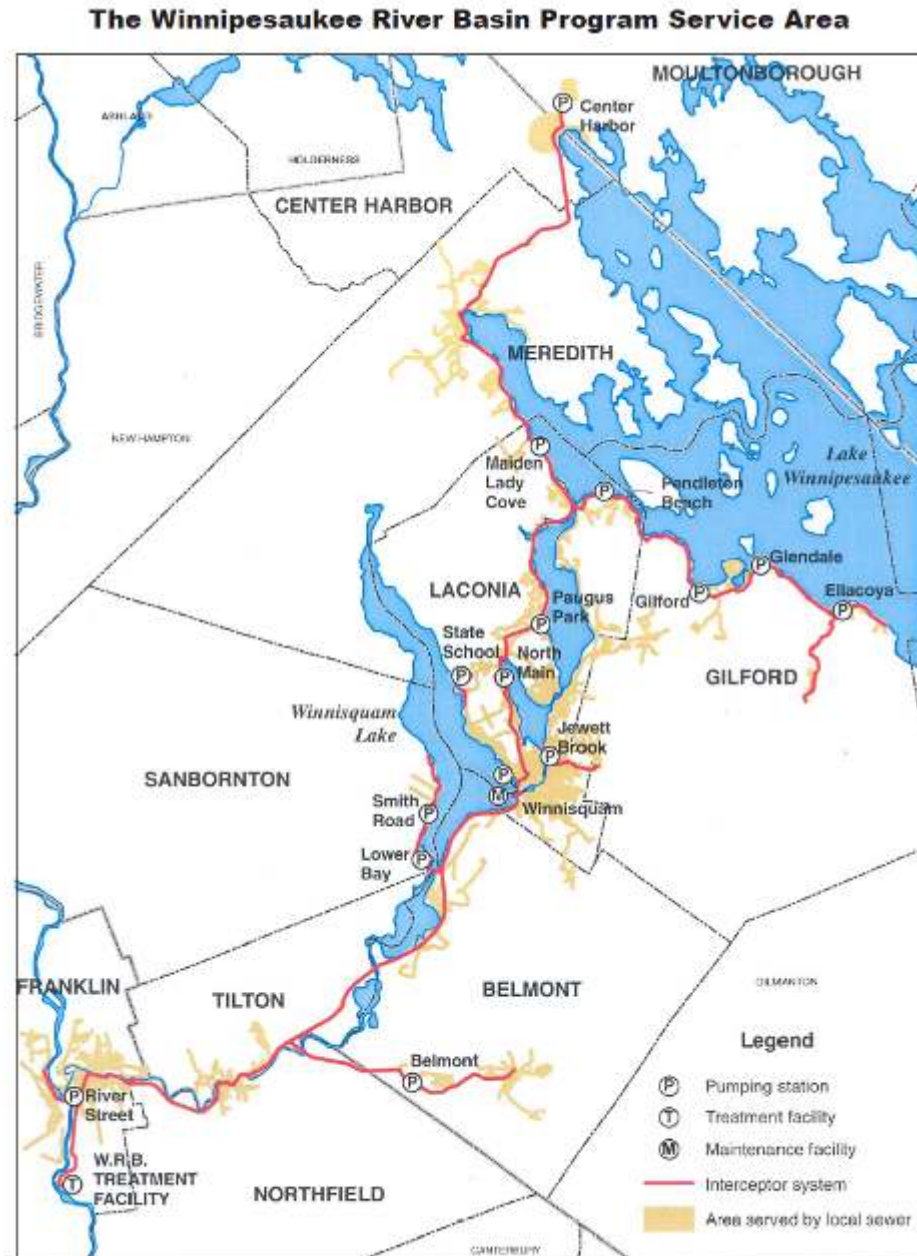
What are sources of P?



Source: lake.access project

What are sources of P?

Nitrates are also a pollutant of concern with failing septic systems



What are sources of P?



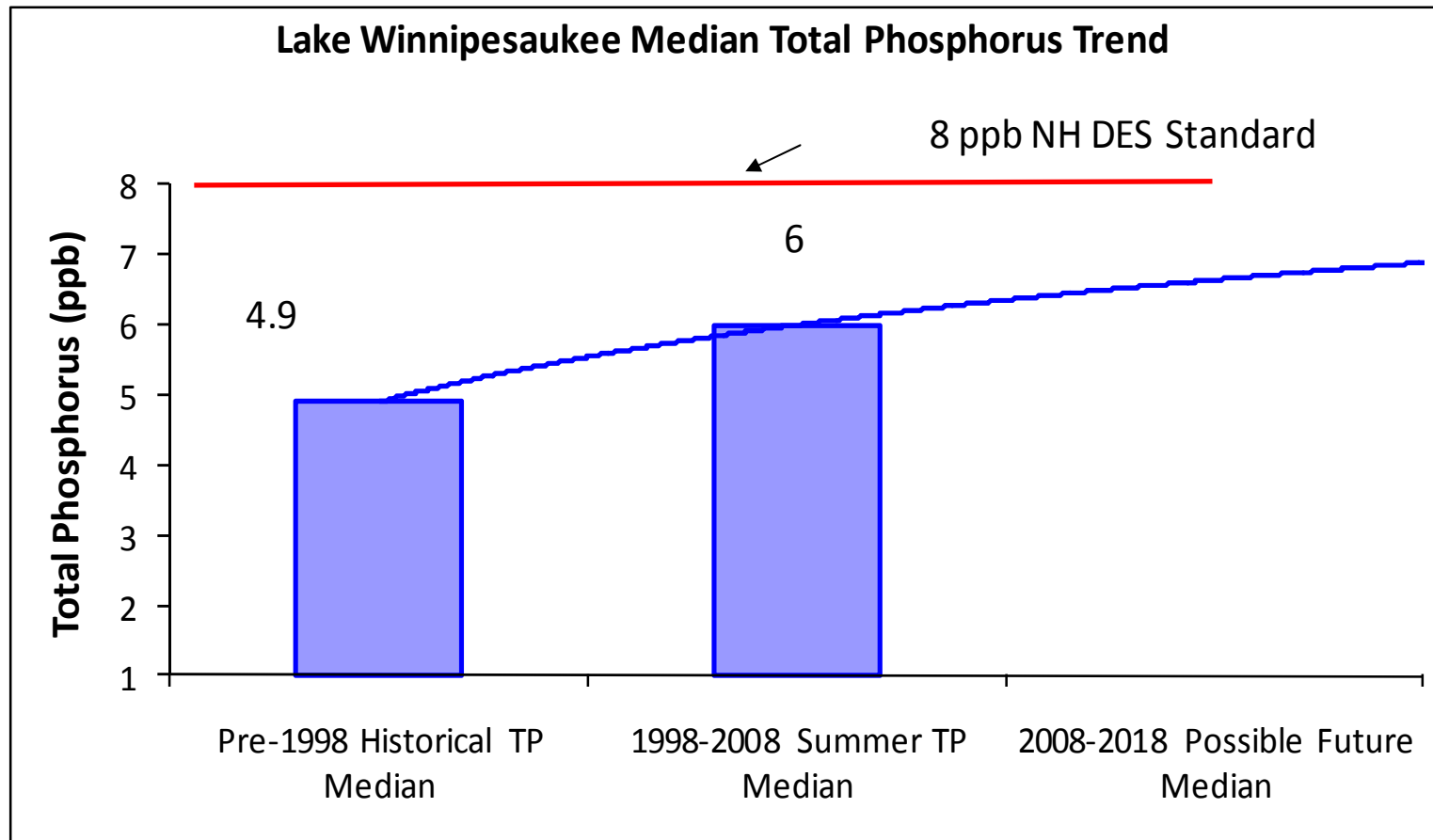
What are sources of P?



What do we need to know to make informed decisions?

- What is the current water quality?
 - ✓ Water quality data analysis
 - How much do we P now?
 - ✓ Estimation of pollutant loads based on land use
 - How can we limit our P in the future?
 - ✓ Pollutant load reductions from implementation of best management practices
 - ✓ Restoration of impaired sites
-

What do we need to know to make informed decisions?



What is the current water quality?

	Existing Water Quality			
	Waukegan	Meredith Bay	Paugus Bay	Saunders Bay
Total P (ug/L)	7.1	6.3	5	5.4
Chl a (ug/L)	2.5	1.9	2.1	1.5

Above data represent the median P values for all sites combined in each bay for the last 10 years.

Meredith, Paugus, and Saunders Bay Sampling Locations



How much do we P now?

Lake Sustainability

Its the **LOAD** that's important!

P LOAD (Mass of P) =

P concentration in tribs & runoff x volume of water from tribs & runoff

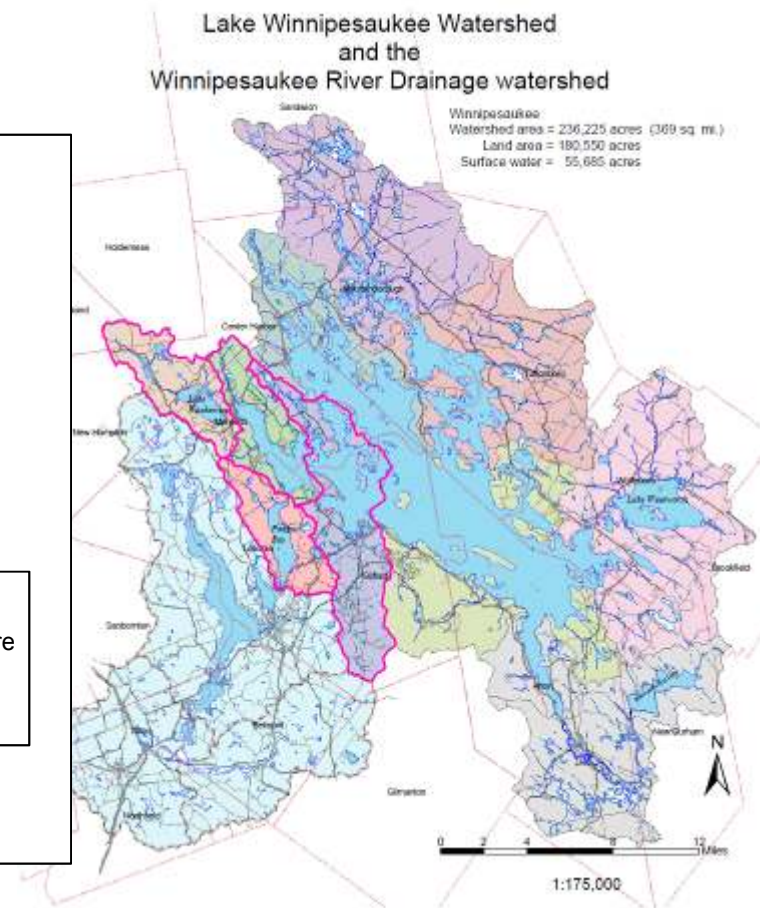
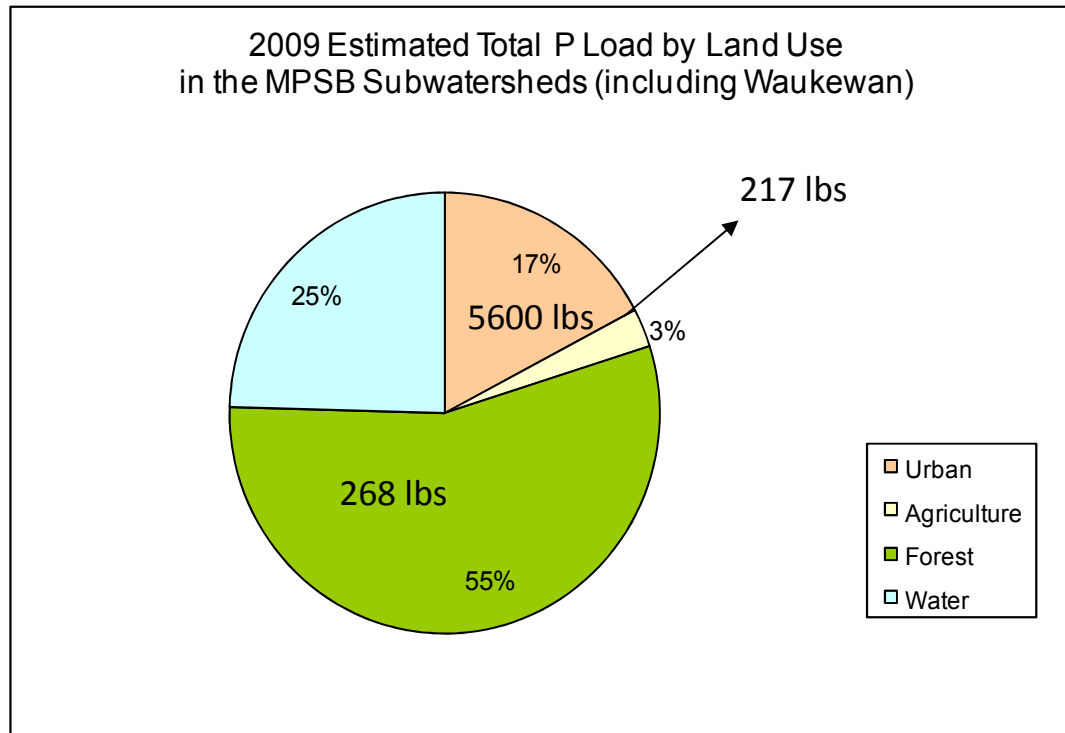
MORE LOAD = FASTER EUTROPHICATION

- Landscape change causes more load*
- Human activity causes more load*

*Unless Best Management Practices are put in place and maintained

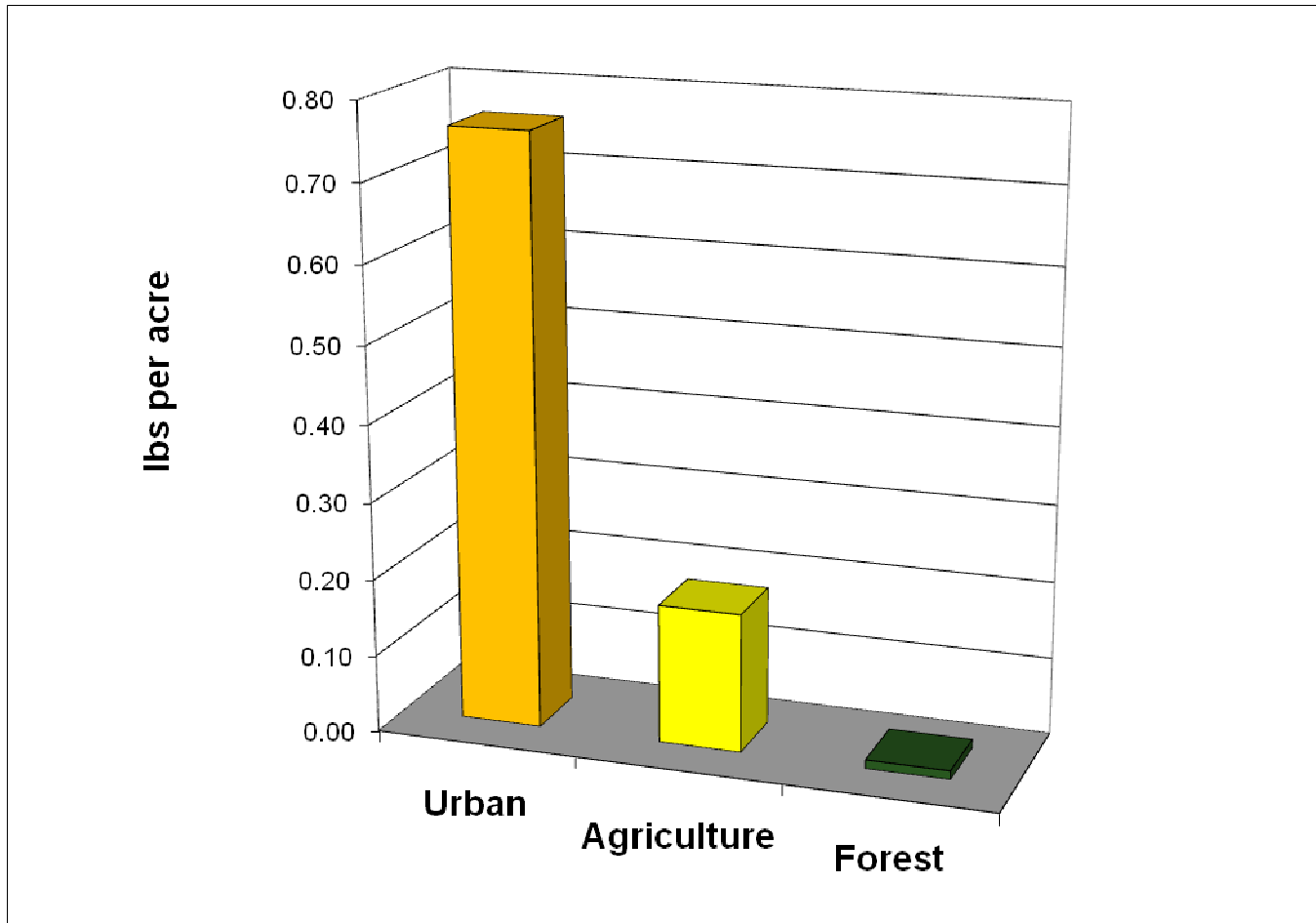
Sustainability is obtained when human activity in the lake watershed is managed so that eutrophication occurs at a no greater rate than natural eutrophication.

Estimated Phosphorus Loading



*Estimate of P loading generated using STEPL Model

Phosphorus Load per acre



Developed Land:

Urban areas,
roads, residential



Agricultural Land:

Includes Pasture
land and crops



Forested Land:

Areas covered
primarily with
trees



How can we limit or reduce P in the future?

- Implement best management practices
 - No phosphorus fertilizers
 - Use Low Impact Development practices
 - Vegetated Buffers along streams, wetlands, shoreland, and roads
- Identify and mitigate sites in need of restoration



**DON'T "P"
IN THE
LAKE!**

Our pristine lakes are at risk of algae blooms and poor water quality from recent overuse of unnecessary fertilizers

Why is Phosphorus bad for our lakes?

1. Phosphorus adheres to sand and soil which can easily run off into the lake to feed milfoil and other invasive species.
2. The cumulative effect of fertilizer application is significant.
3. Over the past 50 years, land development around Lake Waukegan, Meredith's sole drinking supply, has increased almost three-fold.



Protect our lakes and tourist economy by choosing responsible lawn care maintenance

Use zero phosphorus fertilizers on your lawn

"We have been using only phosphorus free fertilizers for the past 5 seasons with very good success."
-Jim Blake, Supervisor of Ground Maintenance
Town of Plymouth, NH

For More Information:
www.safeawns.org
Or Call
Angela, Town of
Meredith 677-4228

Vegetative Buffers are a very effective and low cost best management practice to reduce pollutant loading to surface waters

- 40 ft buffer has a 19% TP removal efficiency
- 50 ft buffer – 26% TP removal efficiency
- 80 ft buffer – 45 % TP removal efficiency



Center Harbor - BMPs



Pavillion drainage before rain garden installation



Pavillion after rain garden installation



Swale with Bioretention basin



Kelsey Ave outfall with level spreader

Questions?



www.lakesrpc.org/lwwmp/
