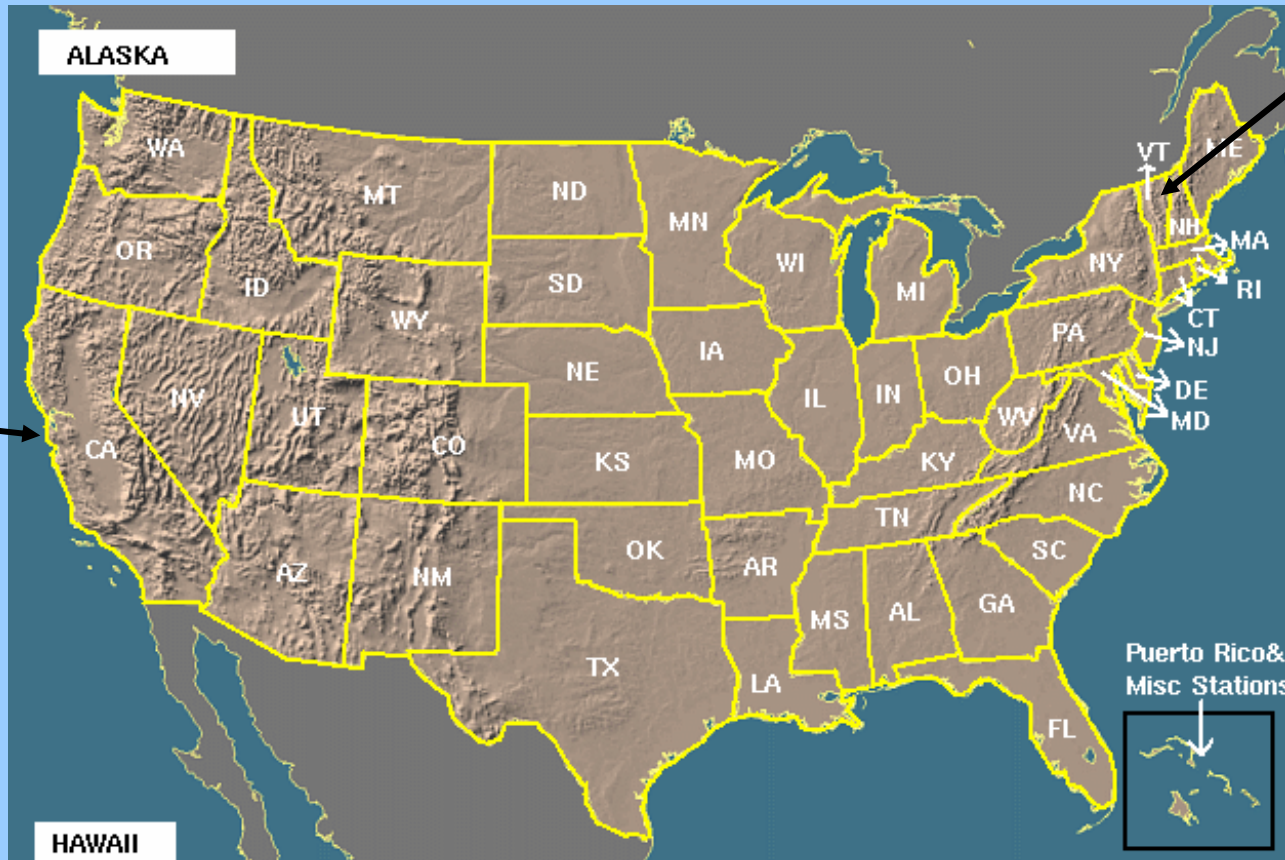


# Where's Vermont?



**Vermont is  
one of six  
lovely New  
England  
states**

**Population  
621,394**

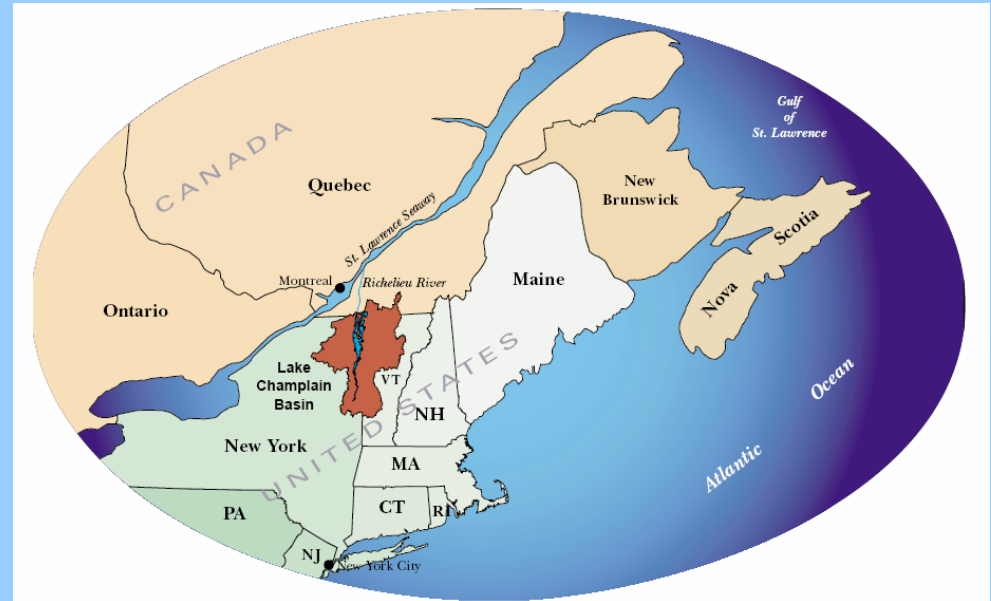
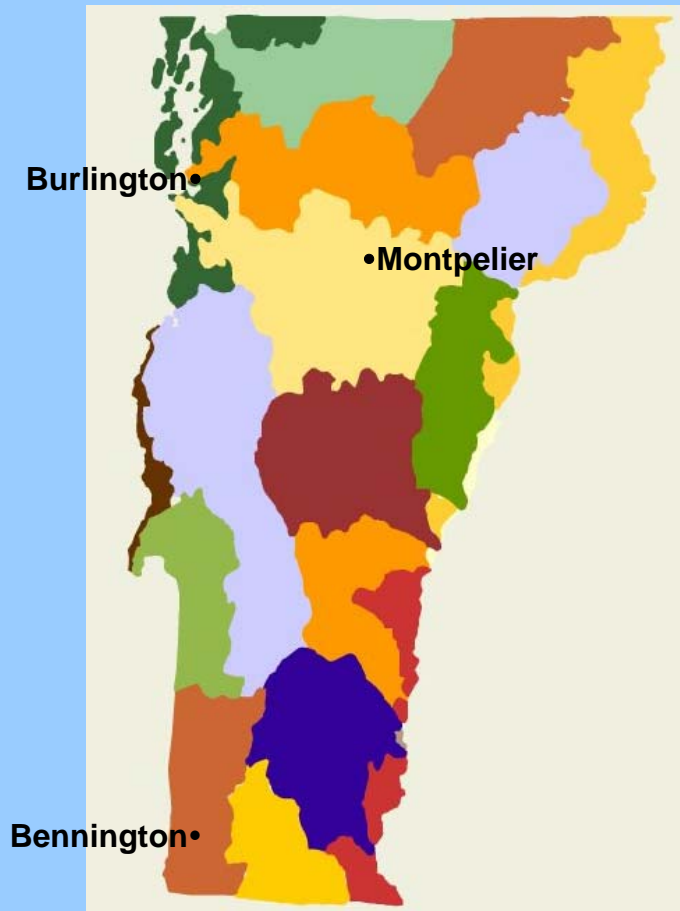
**Happy  
Lake and  
River  
Monitors  
at exciting  
NWQMC**



# Vermont Watersheds

All Waters are Owned by  
the State of Vermont and  
Managed According to:

## 17 MAJOR RIVER BASINS



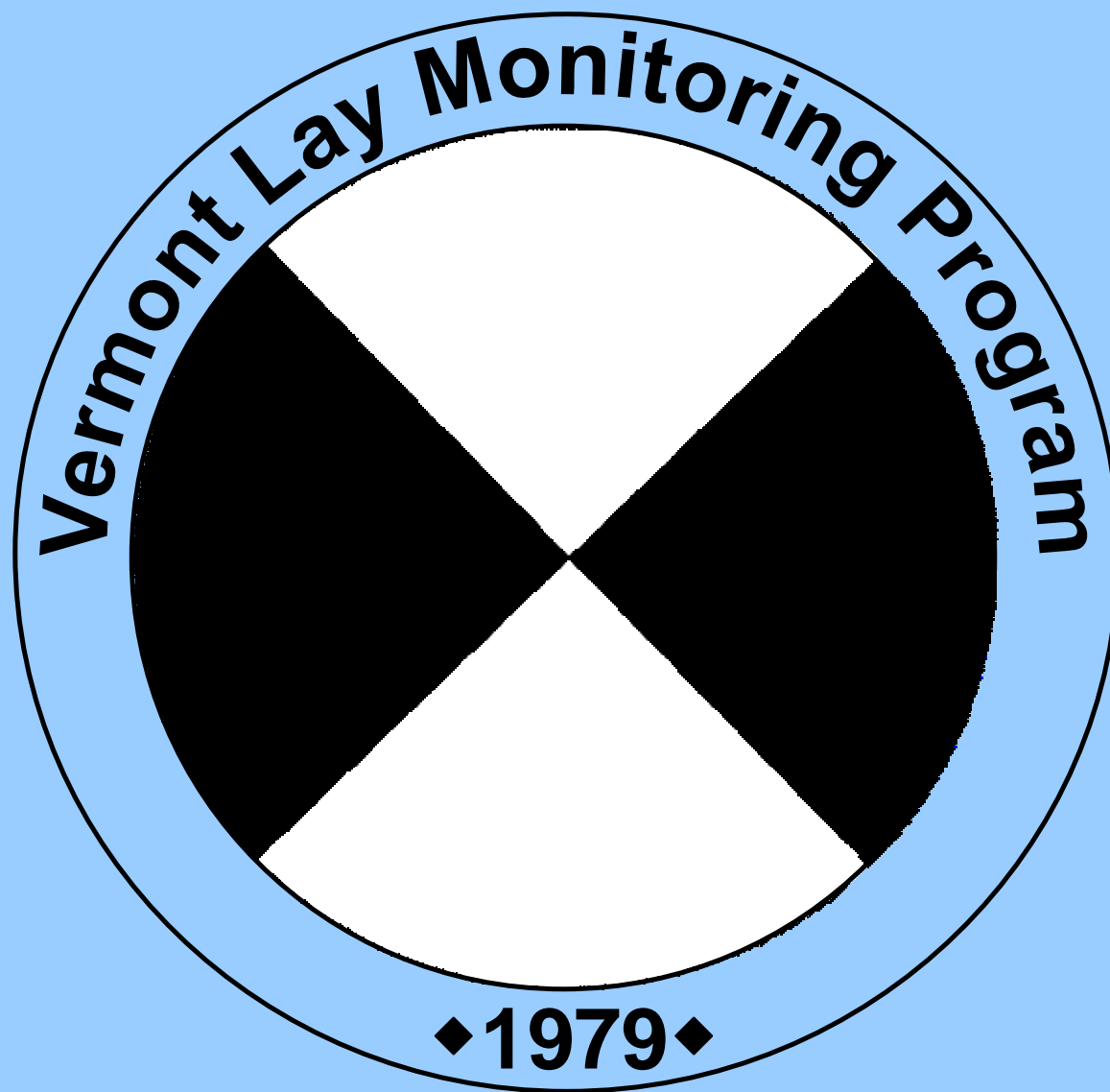
The largest watershed in Vermont is the  
**LAKE CHAMPLAIN BASIN**

- 290 lakes and ponds  $\geq$  20 acres
- 7,100 miles of rivers and streams
- 300,000 acres of wetlands

# The Vermont Lay Monitoring Program

is a cooperative  
effort between  
VTDEC and  
Volunteers





# LMP Principal Objectives:

- To collect water quality data in terms of nutrient enrichment
- To establish a database on each lake
- To involve lake residents in lake protection

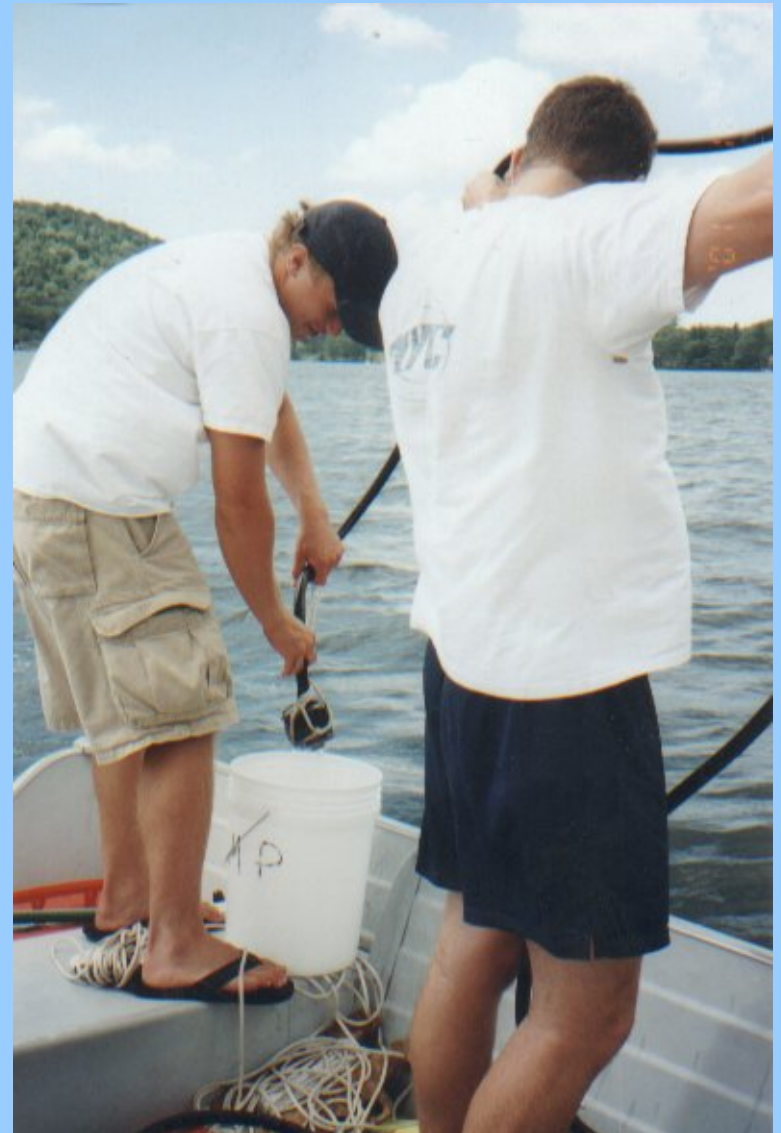
# 2006 Lay Monitoring Program Lakes

## 2006 LAY MONITORING LAKES



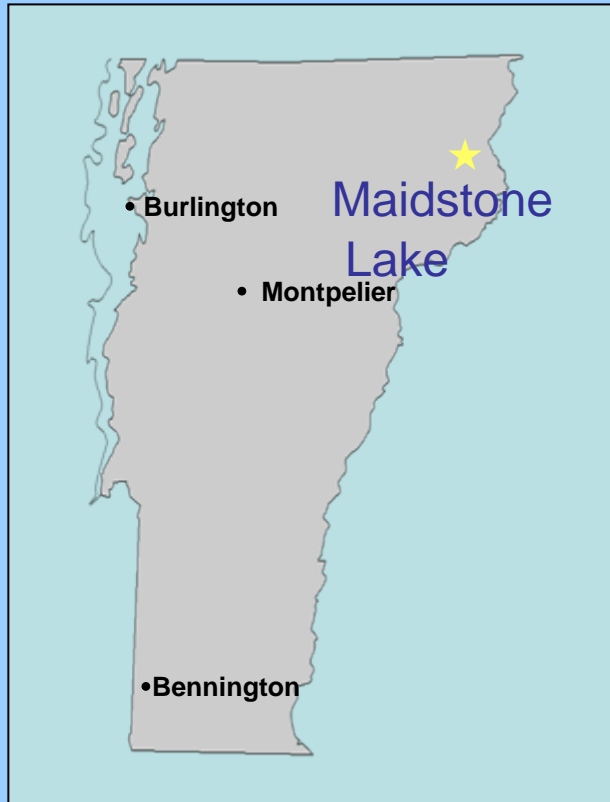












# Basic Program Responsibilities

- Training
- Sampling Equipment
- Sample Pick Up
- Sample Analysis

VTDEC- Water Quality Division

- Boat
- Time
- Sample Storage

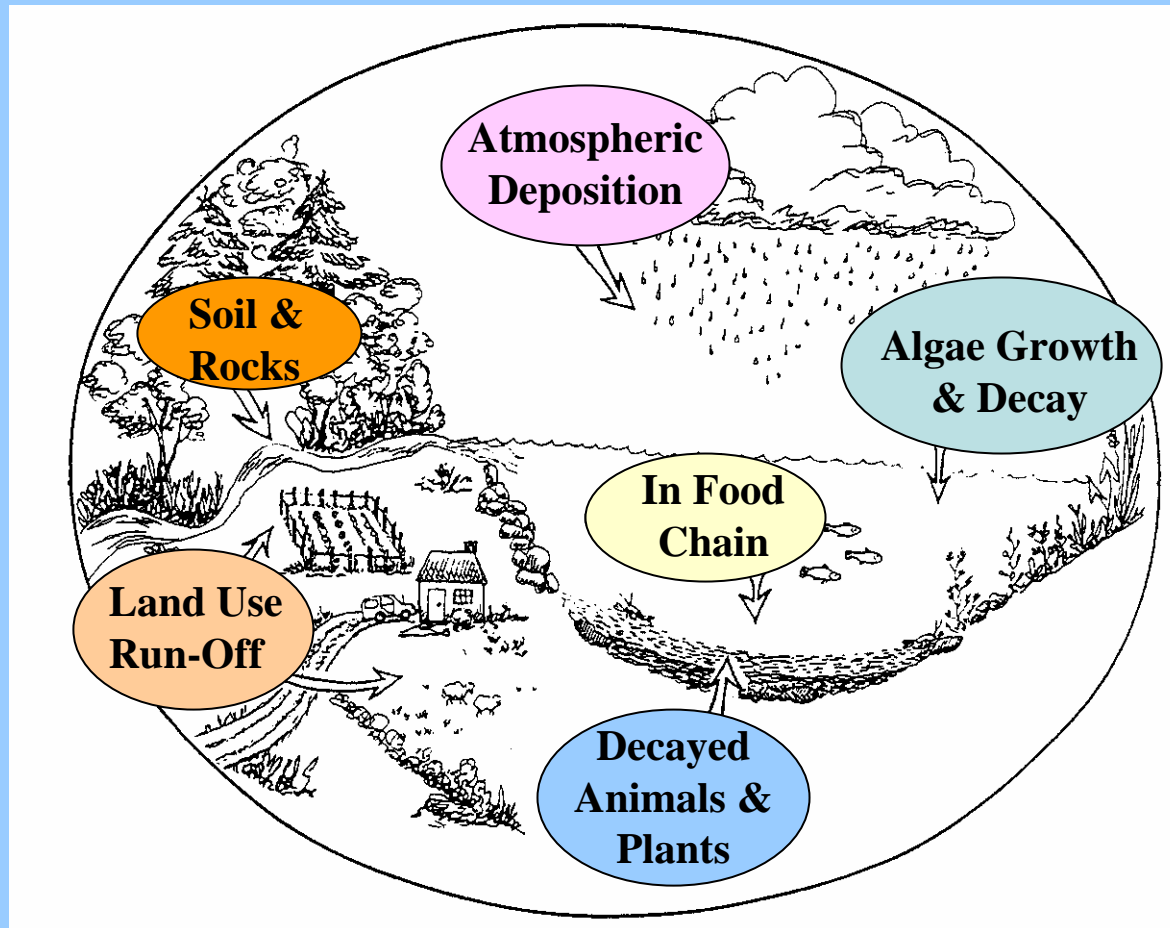
Lay Monitor

# LMP Parameters

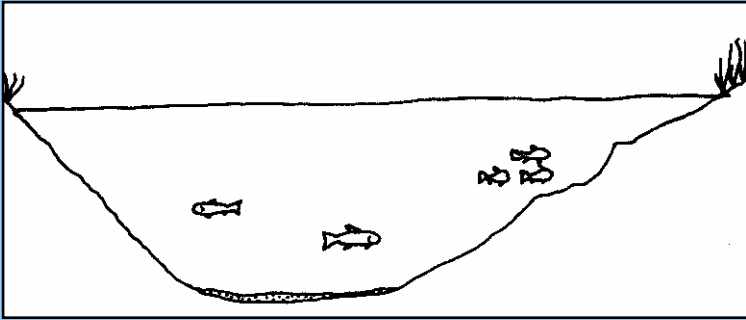
- Total Phosphorus
- Chlorophyll-a
- Secchi Water Clarity



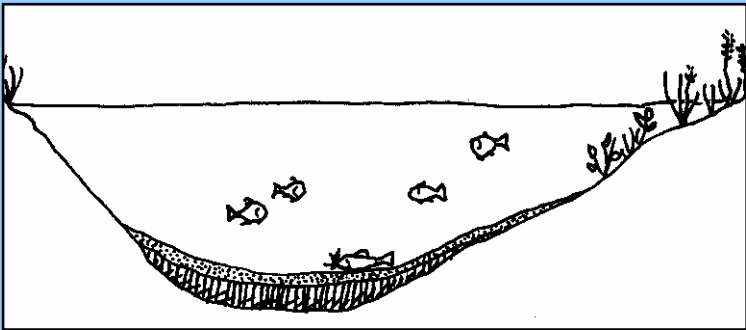
# The Nutrient: Phosphorus



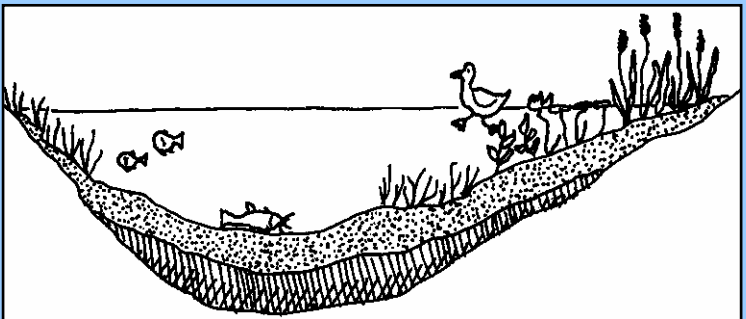
# Excessive Phosphorus in Lakes



**Oligotrophic (young lake)**



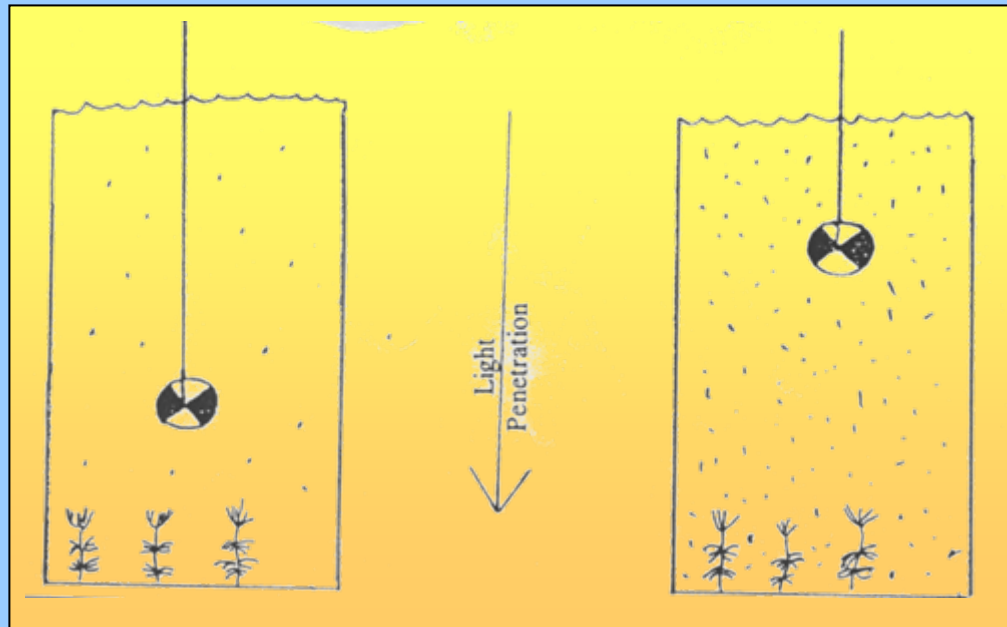
**Mesotrophic (middle age)**



**Eutrophic (older lake)**



# Soooo, the more phosphorus in lakes:



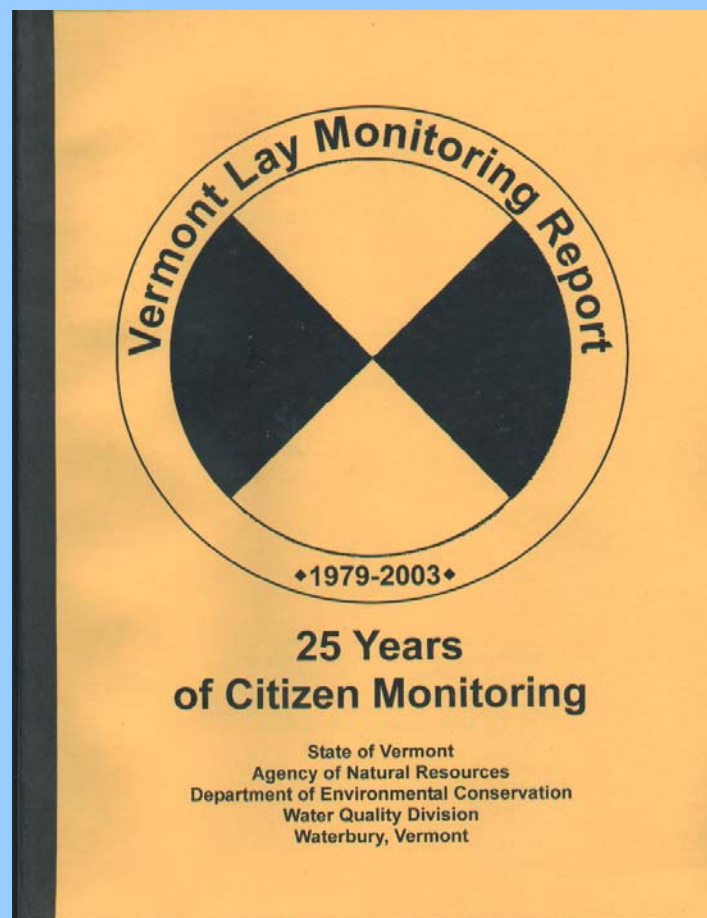
- the more algae and aquatic plant growth and
- the lower the Secchi water clarity readings

# LMP and Trophic State

<u>Trophic State</u>	<u>Ave. Secchi Clarity</u>	<u>Ave. Chl-a Conc.</u>	<u>Ave.TP Conc.</u>
Eutrophic	less than 3.0 meters	more than 7.0 ug/l	more than 14 ug/l
Mesotrophic	3.0-5.5 meters	3.5-7.0 ug/l	7.0-14
Oligotrophic	more than 5.5 meters	less than 3.5 ug/l	less than 7.0 ug/l

# LMP and EPA's Water Quality Data Objectives

- ✓ Precision
- ✓ Accuracy
- ✓ Completeness
- ✓ Representativeness
- ✓ Comparability



# LMP Data: The Essential Lake Assessment Tool

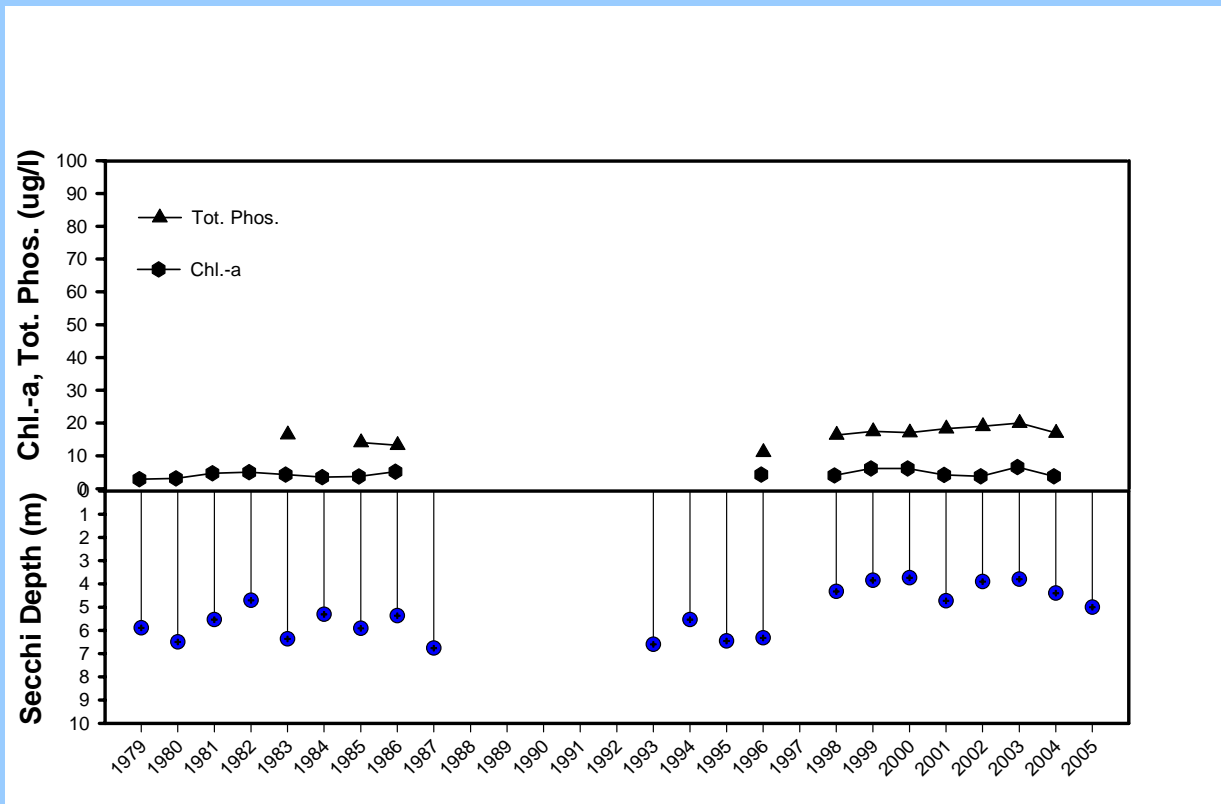
- Established Lake Champlain numerical phosphorus standards
- Used to develop the classification system of Vermont lakes
- Establishes a database on each lake useful for documenting future changes in water quality
- Provides follow-up data to in depth lake studies
- Educational opportunities



# Long Term LMP Data

## Lake St. Catherine

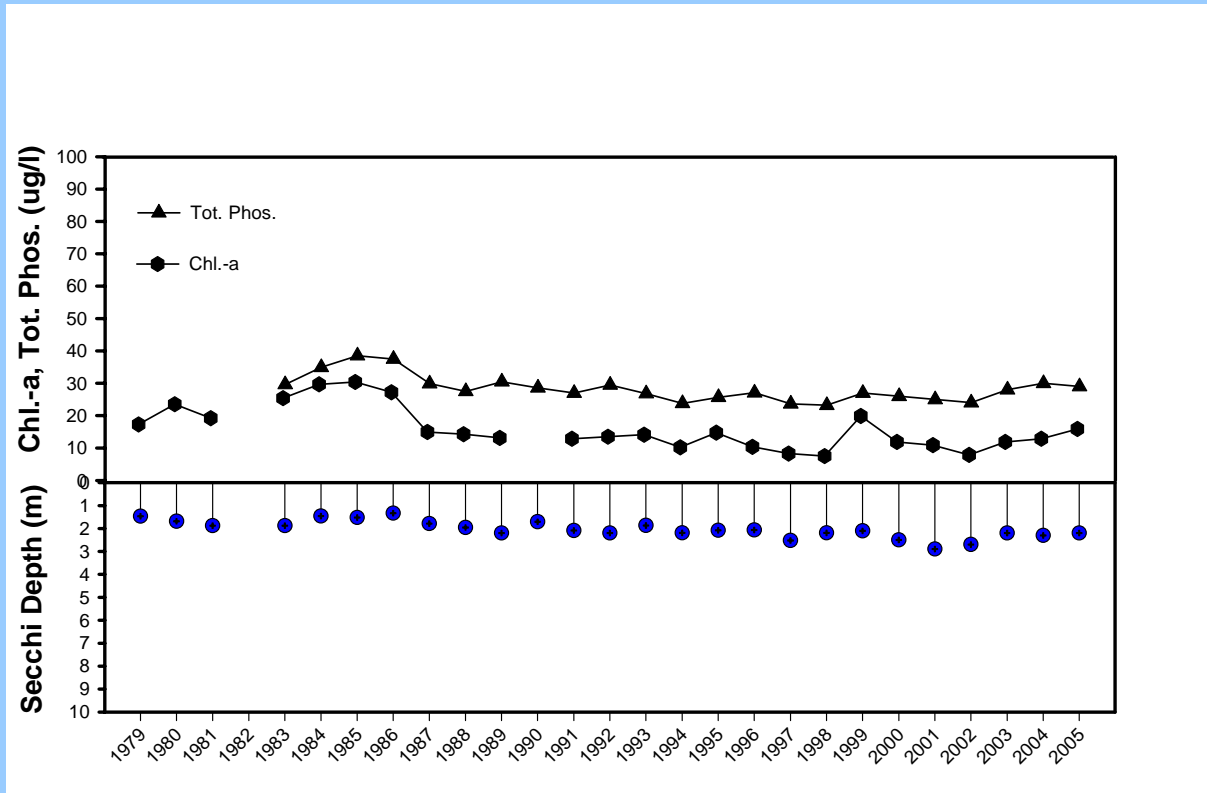
Since 1998, data show a drastic decrease in water clarity since the discovery of the invasive alewife fish, whose feeding habits have affected the lake conditions



# Long Term LMP Data

## Lake Carmi

Shallow, warm water lake showing improvement in water quality conditions since late 1980s

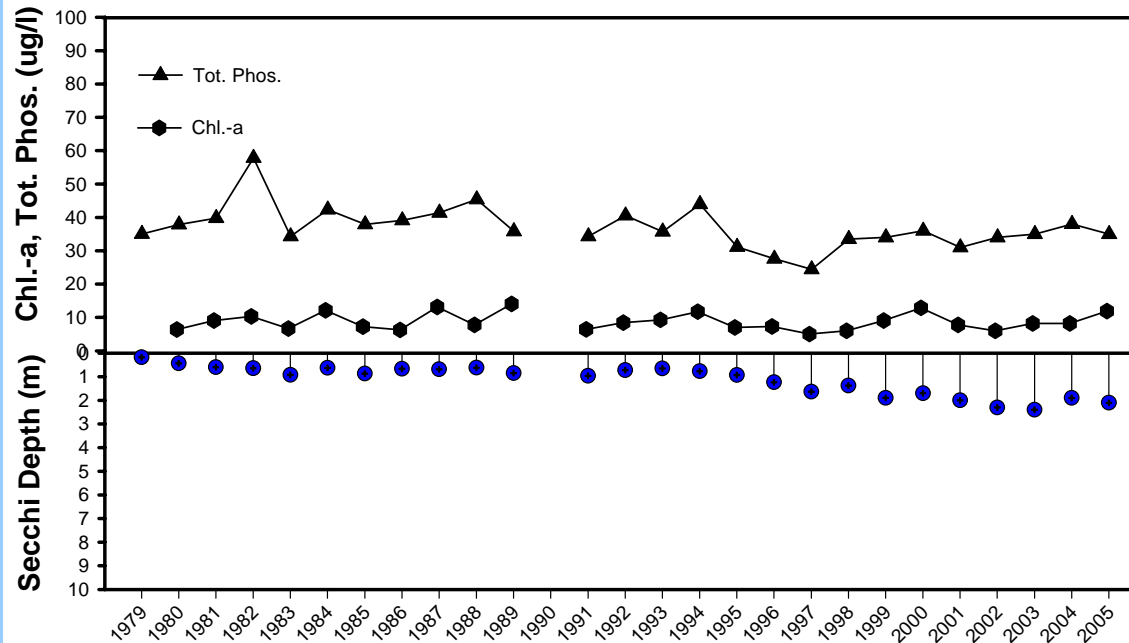




# Long Term LMP Data

## Larrabee's Point on Lake Champlain

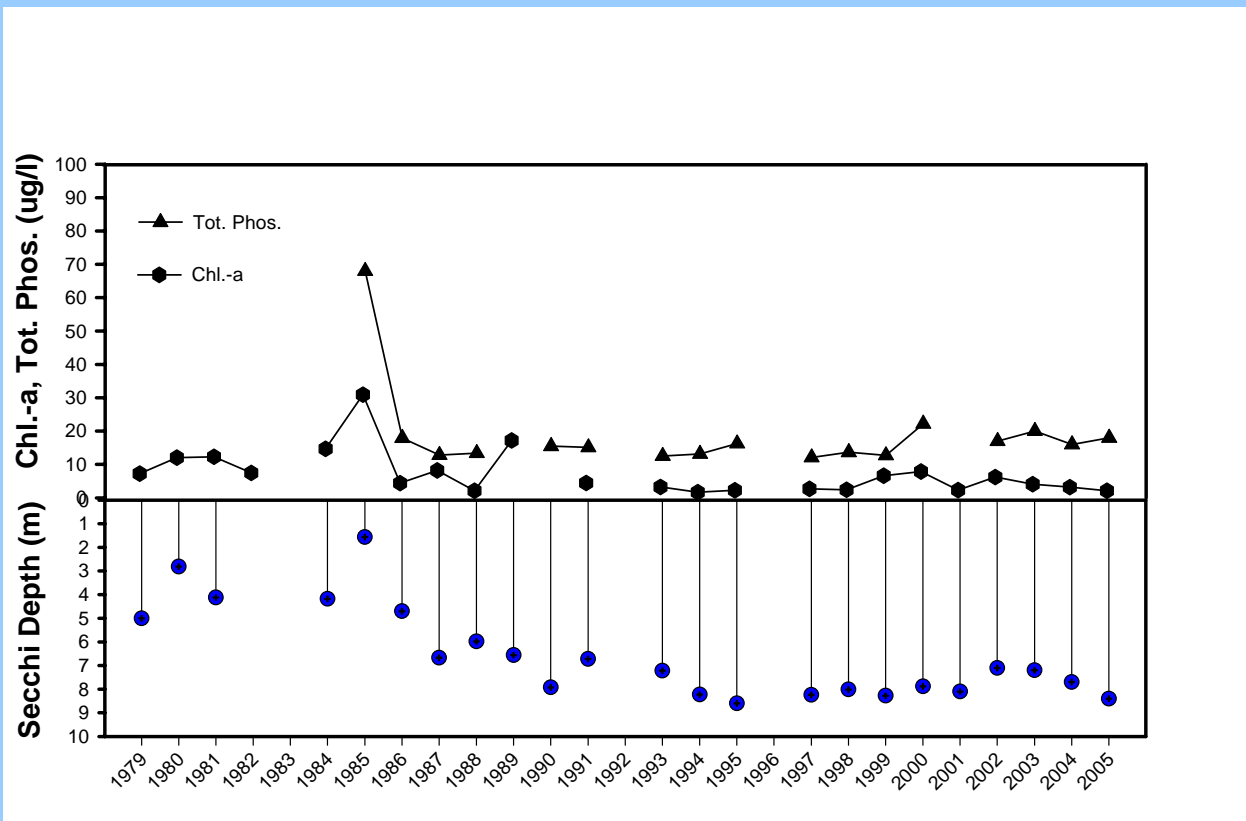
Shows increase in Secchi water clarity readings at same time that zebra mussels were found in the lake



# Long Term LMP Data

## Lake Morey

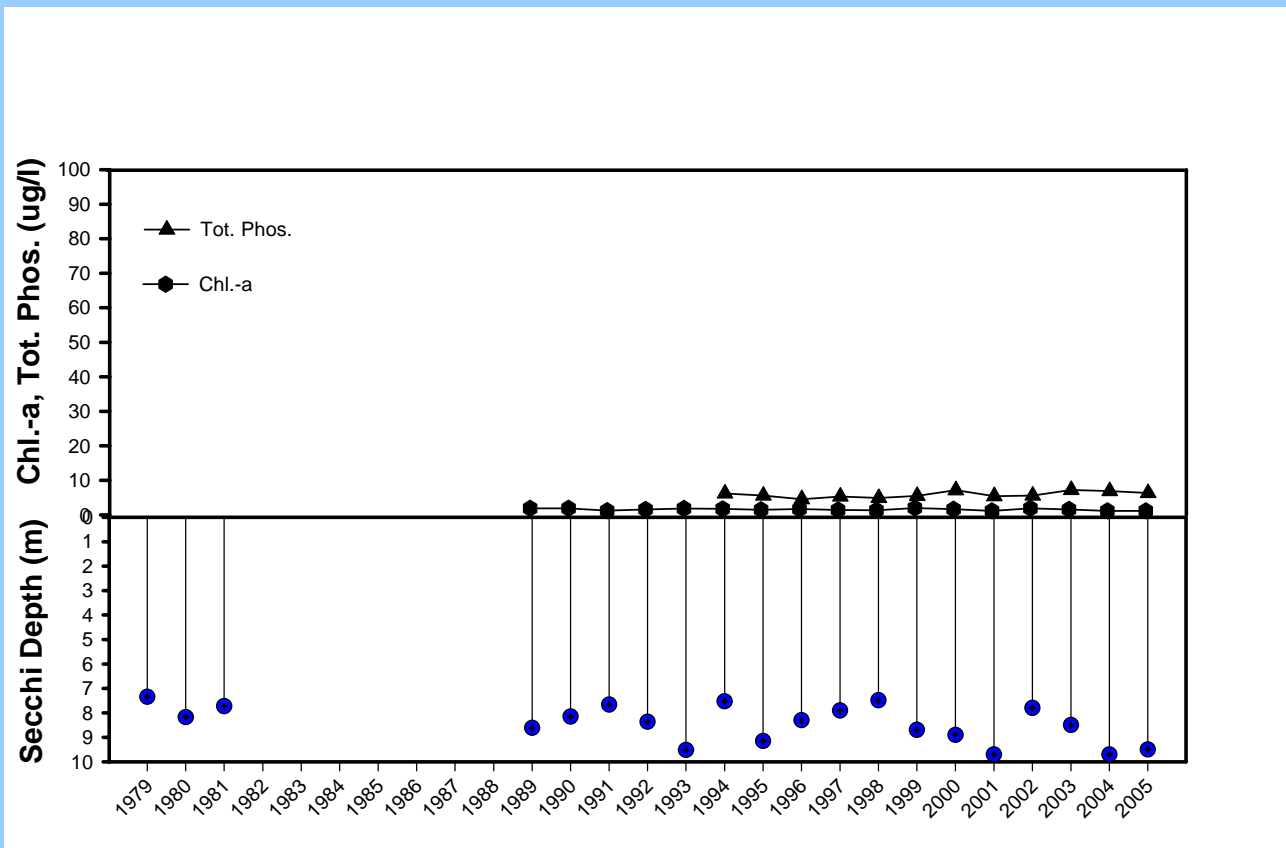
Since 1986 LMP data has tracked the results from the alum treatment



# Long Term LMP Data

## Maidstone Lake

This deep, large waterbody consistently shows excellent water quality conditions



# Additional LMP Activities

## Participating in Additional Monitoring:

- Bioassessment Studies

- Bacteria Monitoring

- Great American Secchi Dip-In

## Attending Water Quality Conferences

- LMP Conferences

- Federation of Vermont Lakes and Ponds

- New England Chapter of NALMS

## Monitoring to Action

- Watershed Surveys and Protection Work

- ANS Control Projects





# Robert Arnold Lake Protection Award

(in honor of Seymour Lake Lay Monitor)

**1998 Tom Benoure**

Fairfield Pond

**1999 James Leamy**

Lake Bomoseen

**2000 Richard Allen**

Lake Morey

**2001 Jackie Sprague**

Harvey's Lake

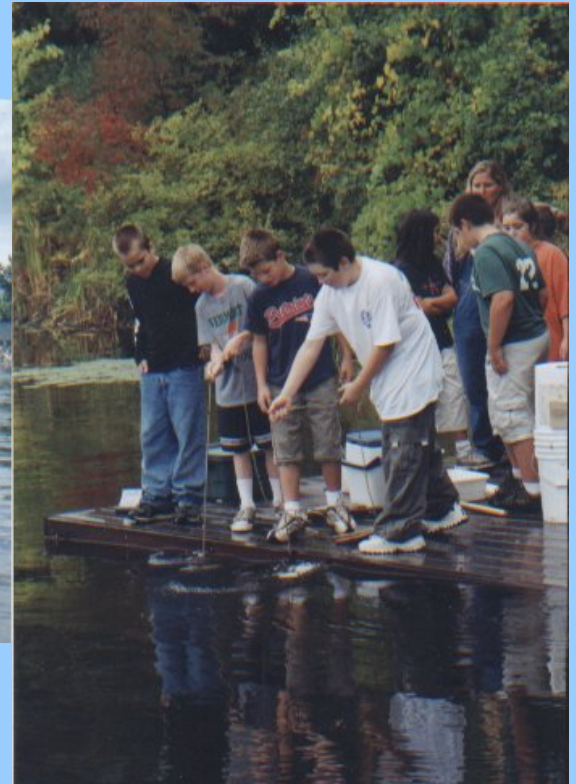
**2003 Jamie Longtin**

Sunset Pond

**2006 Top Secret!**







# Vermont Lay Monitoring Program

VTDEC-Water Quality Division  
103 S. Main St.  
Waterbury, VT  
05671-0408  
802-241-3777  
[www.vtwaterquality.org](http://www.vtwaterquality.org)



